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October 30, 2003

VIA FIRST CLASS MAIL

Mr. Bernard Schorle (HSRL-6) Waste Management Division U. S. EPA Region V 77 West Jackson Blvd. Chicago, IL 60604

Subject:

Report of Water Quality Conditions, Second Quarter 2003

Marion (Bragg) Landfill, Marion, Indiana

Dear Mr. Schorle:

On behalf of the Marion (Bragg) Group, please find enclosed three (3) copies of the Report of Water Quality Conditions for the second quarter of 2003, prepared by O&M, Inc., for the subject site.

Please contact me at (630) 443-1940 with any questions on the enclosed reports.

Sincerely,

de maximis, inc.

Sanf E. Vacher Gary E/Parker

Enclosures

cc: Resa Ramsey, IDEM (cover plus one copy)

John Hanson, Esq., Beveridge & Diamond, P.C. (cover plus one copy)

Rick Meyers, United Technologies (cover plus one copy)

Dan Garrigan, O&M Inc. (cover via facsimile only)

Mark Travers, Environ (cover plus one copy)

FILE: 3004-18\2ndqrt_2003rpt.doc

EPA Region 5 Records Ctr.

REPORT OF

WATER QUALITY CONDITIONS SECOND QUARTER 2003 MARION (BRAGG) LANDFILL

MARION, INDIANA

Prepared on Behalf of:

MARION (BRAGG) LANDFILL GROUP

Prepared by:

O & M, Inc. 303 N. Indiana St. Danville, IN 46122

OCTOBER 2003

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1.0 INTRODUCTION

This report presents water level data, field water quality measurements and results of laboratory analyses for water samples collected at the Marion (Bragg) Landfill site during the semi-annual monitoring event conducted in April 2003. The monitoring program was designed to document the effectiveness of the landfill cap and is described in detail in the Remedial Action Plan (RAP) (Environmental Resources Management (ERM), 1989, Remedial Action Plan, Marion (Bragg) Landfill Site, Marion, Indiana) and Remedial Design/Remedial Action (RD/RA) Work Plan (Environmental Resources Management, 1989, Remedial Design/Remedial Action Work Plan, Marion (Bragg) Landfill Site, Marion, Indiana).

This sampling event continues to implement a condensed monitoring program after the U.S. Environmental Protection Agency (USEPA) issued a no-further-action Record of Decision for this site. Over Twelve (12) years of monitoring data had been collected, since the start of the monitoring program in January 1990.

With concurrence of the USEPA, the number of sampling locations and parameters has been reduced. Monitoring has been reduced to the following locations: for ground water, MB-1, MB-2, MB-5, MB-6, MB-7, MB-8, MB-9, and MB-10, and for surface water, PW-1, SW-1, SW-5, and SW-6.

The sampling program consisted of sampling the on-site monitoring wells (MB-1, -2, and -5 through -10), the on-site pond (PW-1), the Mississinewa River (SW-1 and SW-5), and Lugar Creek (SW-6) for the Target Compound List (TCL) semi-volatiles, Target Analyte List (TAL) metals (dissolved fraction), and the project specific indicator parameters, total suspended solids (TSS), ammonia-nitrogen (NH₃-N), chemical oxygen demand (COD), and chlorides (CI). Selected locations of MB-1, MB-2, and SW-1 are sampled for Target Compound List (TCL) volatiles. These parameters and locations

conductance, and dissolved oxygen) are collected at each of the stated sampling locations.

Water quality sampling at the Marion (Bragg) Landfill for the referenced period was performed on April 29th and 30th, 2003. All sampling and analyses were conducted in compliance with the requirements specified in the RD/RA Work Plan (ERM, 1989) and Quality Assurance Project Plan (ERM, 1990, Quality Assurance Project Plan, Remedial Design/Remedial Action, Monitoring and Additional Studies at the Marion (Bragg) Landfill Site, Marion, Indiana).

Copies of the chain-of-custody forms are included in Appendix A and the data validation report is included in Appendix B. Questions regarding specific analytes, concentrations, or qualifiers are addressed in the data validation report.

2.0 SITE CONDITIONS

Sampling event data is presented in attached Tables 1 through 12 and Figures 1 through 7. Review of that data indicates:

- The interpreted groundwater flow directions are the same as presented in previous reports.
- The water levels in wells, ponds, and river continue to follow seasonal trends
 (Figures 4 to 7). The water level in Monitoring Well (MW-8) was not measured
 due to obstruction in well. O&M Inc. unsuccessfully attempted to remove
 blockage and secured with new lock.
- No methane was detected at any site monitoring locations.

- No methane was detected at any site monitoring locations.
- Calculated concentrations of un-ionized ammonia exceeded the chronic aquatic criteria (CAC) in groundwater samples at downgradient locations, MB-2, MB-6, MB-7, and MB-8. (Table 10). However, after applying the mixing calculation, the concentrations were evaluated as being below the CAC (Table 12).
- The TCL volatile, trichloroethene, was detected in the groundwater sample from
 the on-site monitoring well, MB-1, at a concentration that exceeds the drinking
 water Maximum Contaminant Levels (MCLs). However, after applying the mixing
 calculation, the concentrations were evaluated as being below these criteria
 (Table 12).
- The TAL metals (dissolved), arsenic and iron were detected in groundwater samples from on-site monitoring wells MB-1, MB-2, MB-5, MB-6, MB-7, MB-8 and MB-9 at concentrations which exceeded the appropriate water quality criteria. However, after applying the mixing calculation, the concentrations dropped below the criteria (Table 12).

3.0 COMMENTS

The following general comments are provided regarding sampling procedures, sample documentation, and the data validation report:

- The data validator noted that VOC analysis was not noted on the COC for sample GW07PB. Analysis was run.
- The data validator noted that the pH of the samples were not recorded on the COC upon receipt at the laboratory. The pH of the samples are recorded on the commercial receiving logs attached in Appendix A.
- A copy of the courier airbill is attached to this report as Appendix C
- The data validator noted that matrix spike and matrix spike duplicate (MS/MSD) samples should <u>not</u> be recorded on the COC forms as separate samples, but that extra sample volume should be obtained for the analysis. The sample numbering procedures specified in the Quality Assurance Project Plan (QAPP) calls for the use of a suffix added to distinguish additional sample volumes obtained for MS/MSD analysis. This procedure has been used for all sampling events to date and has proven satisfactory. O&M, Inc. will continue to follow the sample numbering and COC procedures specified in the QAPP until instructed otherwise.

FIGURES

Figure 1
Site Location
Marion (Bragg) Landfill

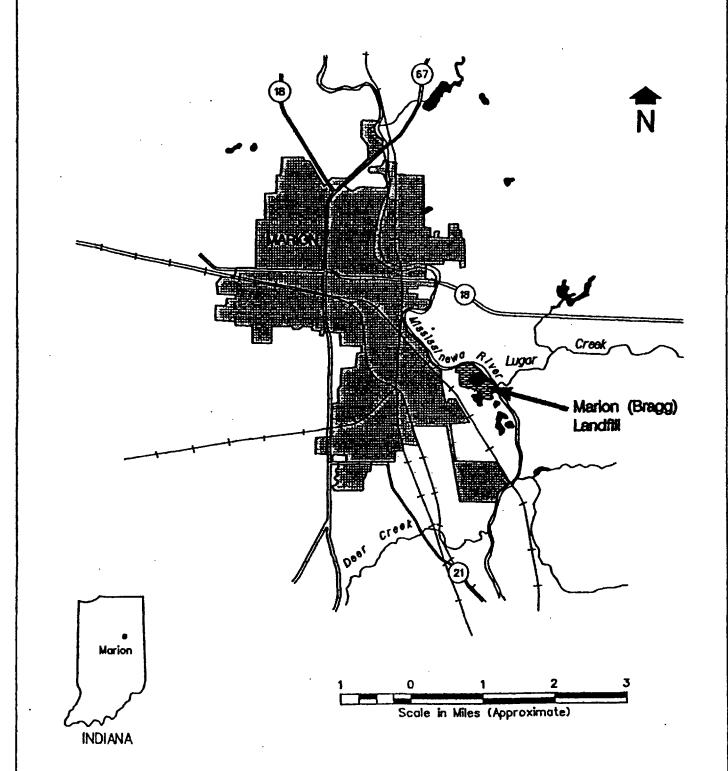


Figure 2 Sampling Locations Marion (Bragg) Landfill

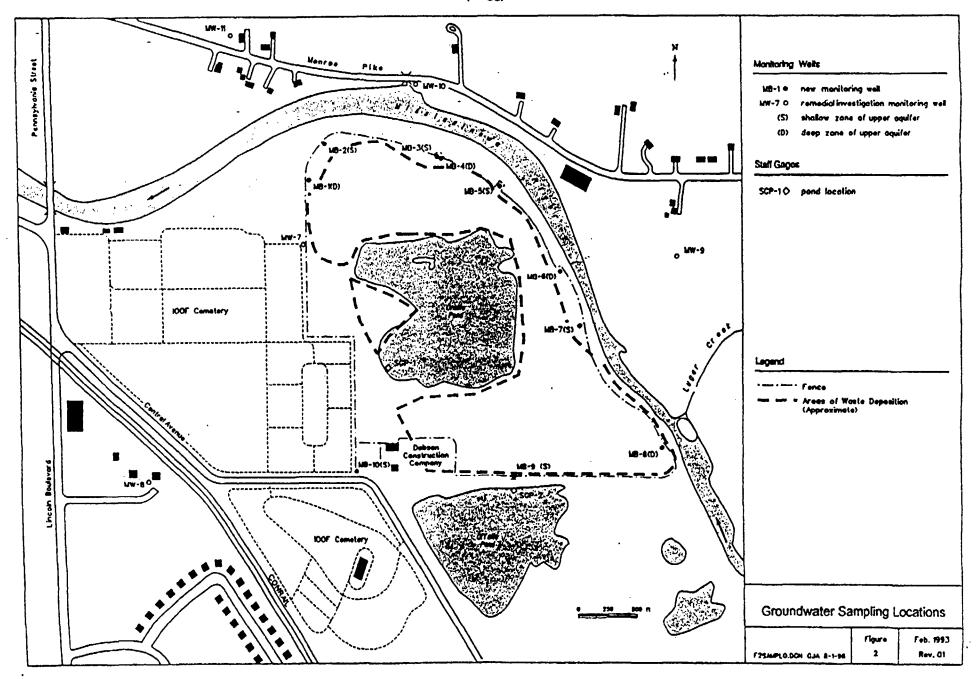
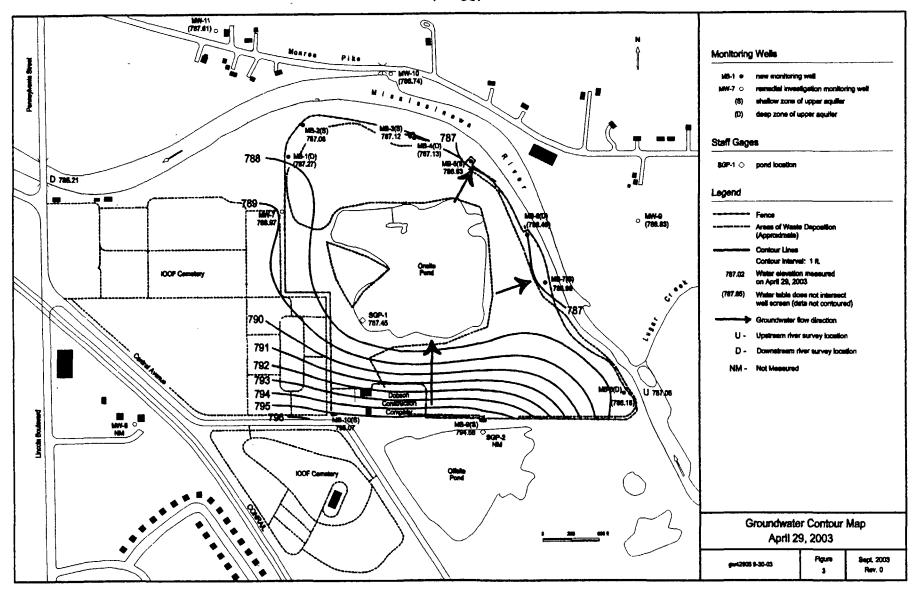
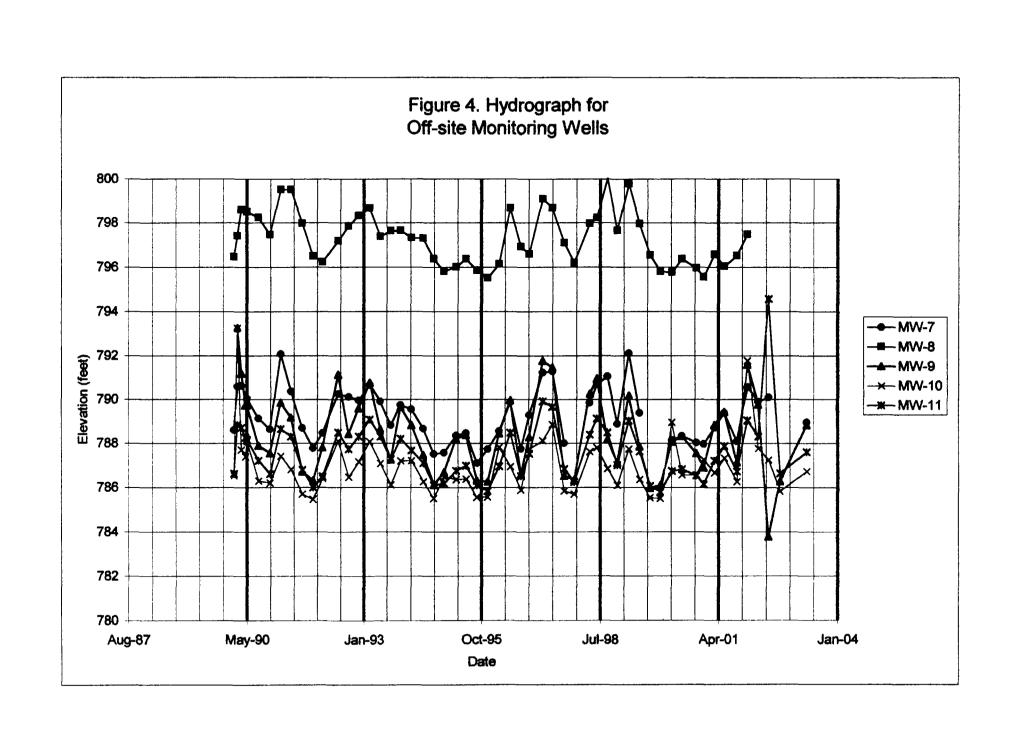
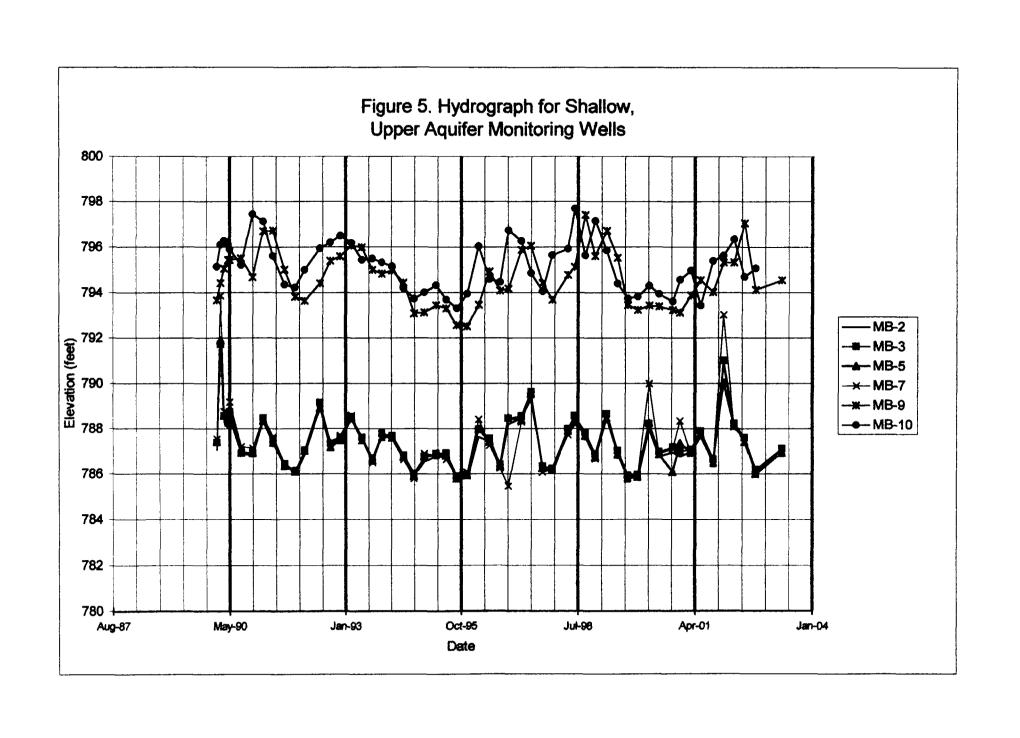
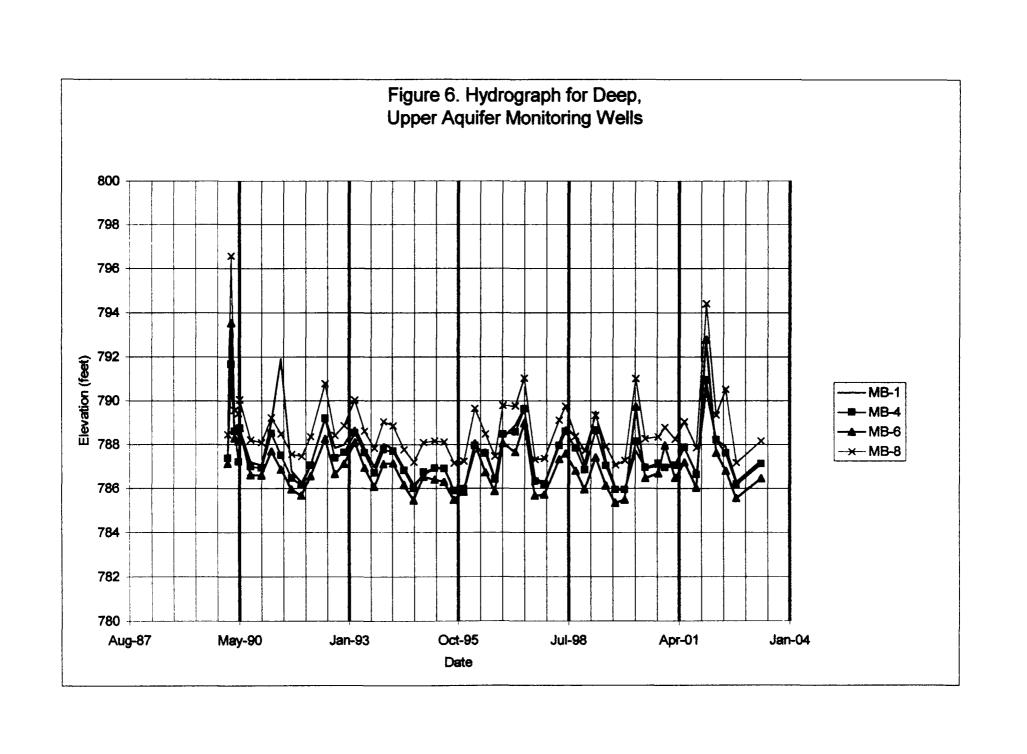


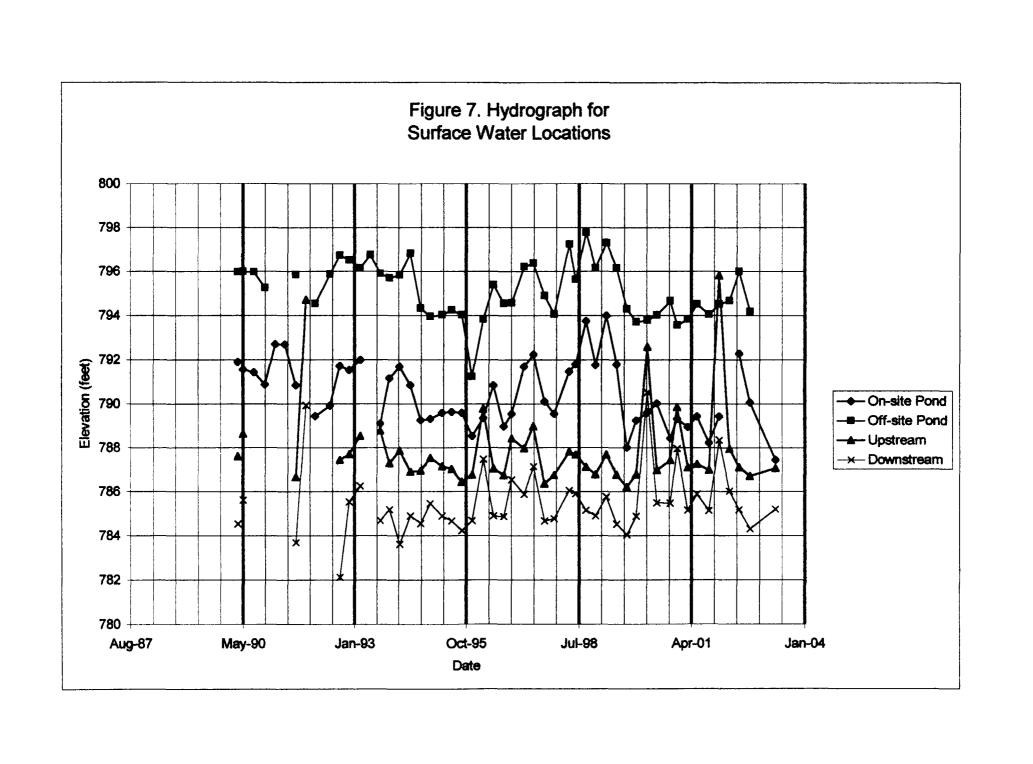
Figure 3
Groundwater Contour Map
Marion (Bragg) Landfill











TABLES

Table 1
SAMPLE SUMMARY MATRIX - MARION (BRAGG) LANDFILL

	Number of	Number of	Number of	Number of Field	Number of Matrix Spike/				
Matrix	8amples	Trip Blanka*	Field Blanks*	Duplicates	Matrix Spike Duplicate Samples **	Total Metrix	Analyses	Container and Preservation	Holding Times
							LABORATORY		
	8 (Note 1)	- 3	1	1	2	13	TCL Volatiles	2-40 ml screw cap vials w/	14 days
inital and semiannual sampling. C								Teflon-lined septa. HCl to pH	
samples shall be taken during the	-							< 2. Cool to 4 C.	
he sampling event that revealed If							pH Check	1-40 ml screw cap vials w/	28 days
parameter requiring such confirms Sampling is anticipated for 30 year			-				prione	Teffon-lined septs. HCi to pH < 2. Cool to 4 C.	20 02,2
							TCL BNAs	2-1 liter amber glass w/ Teflon lined enclosure. Cool to 4 C.	7 days until extraction, 40 days
									after extraction.
							Dissolved TAL Metals	Dissolved samples will be field filtered through a 0.45 micron filter prior to preservation. 1-liter plastic HNO3 to pH <2. Cool to 4C.	
							TSS, Chloride, NH3-N	1-liter plastic, Cool to 4C	3 days (TSS) 28 days (CI) 28 days(NH3-N)
							COD	1-250 mi plastic H2SO4 to pH <2. Cool to 4C	28 days
-							FIELD		
							pH, Conductivity D.O. and Temp.	Measure in field to stability before collection.	in field.

Note 1: Welts MB-3 and MB-4 were not sampled this quarter as part of an interim reduced monitored program following a "No further action" ROD.

^{* -} Trip blanks are required for volatile organic analysis at a frequency of one per cooler shipped containing volatile organic analysis.

^{** -} Triple the volume for groundwater and surface water locations will be collected for matrix spike duplicate analyses at a frequency of one per 20 investigative samples, inorganic analyses will include a single matrix spike and a laboratory duplicate vs. matrix spike duplicate.

Table 1 - Continued SAMPLE SUMMARY MATRIX - MARION (BRAGG) LANDFILL

	Number of	Number of	Number of	Number of Field	Number of Matrix Spike/	1 -	ł		ŀ
Metrix	Samples	Trip Blanks*	Field Blanks*	Duplicates	Matrix Spike Duplicate Samples **	Total Matrix	Analyses	Container and Preservation	Holding Times
					•		LABORATORY		
BURFACE WATER	4 (Note 1)	3	1	1	2	9	TCL Volatiles	2-40 mi screw cap vials w/	14 days
ritial and comisensual eampling.	Confirmatory							Teffon-lined septe. HCl to pH	
ampies shall be taken during th	e quarter following							< 2. Cool to 4 C.	
re earnpling event that revealed	the presence of a						•		
eremeter requiring such confirm	natory sampling.						pH Check	1-40 ml screw cap vists w/	28 days
ampling is unfolpated for 30 ye	ner#.) ·							Tefion-lined septe. HCl to pH < 2. Gool to 4 C.	
							TCL BNAs	2-1 litter amber glass w/ Tefton lined enclosure. Cool to 4 C.	7 days until extraction, 40 days efter extraction.
							Dissolved TAL Metals	Dissolved samples will be field filtered through a 0.45 micron filter prior to preservation. 1-liter plastic HNO3 to pH <2. Cool to 4C.	
							T98, Chloride, NH3-N	1-liter plastic, Cool to 4C	3 days (TSS) 28 days (Ci) 28 days(NH3-N)
							COD	1-250 mi plaetic H2SO4 to pH <2. Cool to 4C.	28 days
							FIELD		
							•	Measure in field to stability before collection.	in field.

Note 1: The on-site pand location of PW-2, off-site pand locations of PW-3 and PW-4, and river locations of SW-2, -3, and -4 were not sampled this querier as part of an interim reduced monitored program following a "No further action" ROD.

^{* -} Trip blanks are required for volatile organic analysis at a frequency of one per cooler shipped containing votatile organic analysis.

^{** -} Triple the volume for groundwater and surface water locations will be collected for matrix spike/matrix spike duplicate analyses at a frequency of one per 20 investigative samples, inorganic analyses will include a single matrix spike and a laboratory duplicate vs. matrix spike duplicate.

TABLE 2: WATER LEVEL AND METHANE MONITORING DATA, MARION (BRAGG) LANDFILL, APRIL 29, 2003

	Top of		Ground			-		
	Casing -		Surface	Methene	W	ister	Water	
	Elevation	Stickup	Elevation	Consentr	itien L	evel	Elevation	
Monitoring Location	(ftamel)	(10)	(flamel)	(%)	(T	btoo)	(flamel)	
MB-1	799.57	2.50	79	7.07	۵٥	12.30		767.2
MB-2	801.75	2.80	79	8.96	0.0	14.69		787.0
MB-3	806.15	2.70	80	3.45	0.0	19.03		787.1
MB-4	805.96	2.60	80	3.36	0.0	18.83		787.1:
MB-5	806.67	3.00	80	3.67	0.0	19.94		786.9
MB-6	803.58	3.50	60	0.08	0.0	17.12		786.4
MB-7	612.73	3.00	80	9.73	0.0	25.78		786.94
MB-8	810.73	3.00	80	7. 73	0.0	22.55		766.18
MB-0	814.73	2.80	81	1.93	0.0	20.17		794.5
MB-10	822.35	3.10	81	9.25	0.0	27.28		795.0
MW-7	802.36	2.62	79	P.54	0.0	13.39		789.97
MAV-8 (1)	810.87	3.08	80	7.79	NM	NM		NB.
MW-0	808.04	2.57	80	3.47	0.0	17.21		786.83
MW-10	803.17	2.27	80	0.90	0.0	16.43		788.7
M W-11	811.09	2.83	80	8.26	0.0	23.46		767.6
Staff Gauges	Elev. at the 0 Mark o	of Staff Gauge			D	istance Below 6	Mark of Staff Gauge (2)	
SGP-1 (2)	787.45	NA	NA	NM		0.00		787.4
Staff Gauges	Top of Staff Gause	Elevation			D	istance Below To	pp of Staff Gauge (3)	
SGP-2	798.16	NA	NA	NM	N	М		
River Elevation	Benchmark Elevetic	<u>211</u>			2	urveyed Distance	1	
Upetream location (4)	610.73	NA	NA.	NM		23.67		787.00
Downstream location (5)	798.94	NA	NA.	MM		11.73		785.2

Stickup - Measured distance between the ground surface and the top of casing

ftemsi

- feet above mean sea level

fibtoc

- feet below top of casing. For staff gauges, valve presented is measurement (in feet) below level of staff gauge.

- (1) MW-8 was not measured due to blockage in well.
- (2) O&M Inc. reinstalled and resurveyed during this quarter sampling event.
- (3) Pond water level measured from surveyed top of staff gauge down to pond water.
- (4) Elevations determined by surveying to known benchmark elevations; benchmark for upstream location MB-8 top of casing,
- (5) Elevations determined by surveying to known benchmark elevations; benchmark for downstream location is concrete spiilway on east side of McFeelev Bridge.

SGP-1 - On-Site Pond SGP-2 - Off-Site Pond NM - Not Messured NA - Not Applicable

TABLE 3: FIELD WATER QUALITY MEASUREMENTS CONDUCTED DURING WELL PURGING, APRIL 2003

Well I.D.	Total Depth (ft)	Approx Stickup (ft)	Depth to Water (fibtoc)	Casing Volume (gal)	Dete	Volume Pumped (gal)	pH	Temp (C)	Specific Conductance (umhos/cm) (1)	Specific Conductance (umhos/cm) (2)	Dissolved Oxygen (mg/L)
MB-1	37	2.50	12.30	4.00	04/30/03				-		
						12.0	7.5	14.0	700	888	2.3
		_				12.5	7.5	14.0	700	888	2.0
						13.0	7.4	14.0	700	888	2.3
MB-2	18	2.80	14.69	0.54	04/30/03						
						2.0	7.0	16.0	1000	1207	2.9
						2.5	6.9	15.0	1000	1238	2.2
						3.0	6.9	15.0	950	1176	2.4
MB-3	24	2.70	19.03	0.81	•	(Well removed fr no-further-action f			ring program as part of a	a condensed monitoring	program follo
MB-4	35	2.60	18.83	2.62	•	(Well removed from the contraction for the con			ring program as part of a	condensed monitoring	program follo
MB-5	24	3.00	19.94	0.66	04/30/03						
						2.0	7.4	17.0	480	56 6	3.0
					•	2.5	7.2	15.5	800	978	1.3
						3.0	7.2	15.0	800	990	1.3
						3.5	7.2	14.5	800	1003	1.9
MB-6	28	3.50	17.12	1.76	04/30/03						
						5.5	7.0	15.0	780	965	1.4
						6.0	6.9	15.0	750	928	1.5
						6.5	7.0	14.5	780	977	1.2
MB-7	32	3.0	25.78	1.01	04/30/03						
						3.0	6.9	16.0	730	881	2.8
						3.5	7.1	16.0	750	905	2.7
						4.0	7.1	15.5	710	868	2.4
				0.40	04/30/03						
MB-8	36	3.0	22.55	2.18	0-1/30/03						
MB-8	36	3.0	22.55	2.18	04/30/03	5.0	7.3	16.0	1000	1207	1.8
MB-8	36	3.0	22.55	2.18	04/30/03	5.0 5.5 6.0	7.3 7.3 7.2	16.0 15.0 15.0	1000 1000 1000	1207 1238 1238	1.8 1.5 1.5

TABLE 3: FIELD WATER QUALITY MEASUREMENTS CONDUCTED DURING WELL PURGING, APRIL 2003

Welf I.D.	Total Depth (ft)	Approx Stickup (ft)	Depth to Water (ftbtoc)	Casing Volume (gal)	Dete	Volume Pumped (gal)	pH	Temp (C)	Specific Conductance (umhos/cm) (1)	Specific Conductance (umhos/cm) (2)	Dissolved Oxygen (mg/L)
MB-9	29	2.80	20.17	1.43	04/30/03						
						4.5	7.8	13.5	390	501	2.2
						5.0	7.8	13.5	400	514	2.0
	•	-		•		5.5	7.7	13.5	380	489	1.9
MB-10	30	3.10	27.28	0.44	04/30/03						
						1.5	7.4	13.5	650	836	4.4
						2.0	7.3	13.0	625	814	4.8
						2.5	7.2	13.0	625	814	4.8

NA - Not Applicable

fibtoc - feet below top of case

stickup - measured distance between the ground surface and the top of casing

(1) - Field measured conductivity.

(2) - Specific conductance value corrected to 25 C and adjusted using conversion factor (K).

Table 4 Data Qualifier Definitions

Qualifier	Description
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value represents its approximate concentration
UJ	The analyte was not detected about the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table 5 Marion (Bragg) Landfill Sample Designation Key Second Quarter 2003 Sampling Event April 2003

Sample Designation	Sample Location	Parameters	Date Collected		
Ground Water					
GW01PB	MB-10	TSS, Cl⁻, COD, NH₃-N, Dissolved metals, SVOCs	04/30/03		
GW02PB MB-9		TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	04/30/03		
GW03PB MB-5		TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	04/30/03		
GW04PB	MB-6	TSS, Cl⁻, COD, NH₃-N, Dissolved metals, SVOCs	04/30/03		
GW05PB	MB-7	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	04/30/03		
GW06PB MB-8		TSS, Cl⁻, COD, NH₃-N, Dissolved metals, SVOCs	04/30/03		
GW07PB	MB-2	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	04/30/03		

Table 5 Continued

Sample Designation	Sample Location	Parameters	Date Collected		
GW08PB	MB-1	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	04/30/03		
GW08DPPB MB-1 GW08MSPB MB-1		TSS, Cl⁻, COD, NH₃-N, Dissolved metals, VOCs, SVOCs	04/30/03		
		PB MB-1 TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs			
GW08MSDPB	GW08MSDPB MB-1		04/30/03		
GW09FBPB Field Blank		TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	04/30/03		
GW10TBPB	Trip Blank	VOCs	04/30/03		
Pond Water					
PW01PB	PW-1 (On-site shallow)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	04/29/03		

Table 5 Continued

Sample Designation	Sample Location	Parameters	Date Collected
River Water			,
SW01PB	SW-1 (Downstream)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	04/29/03
SW01DPPB	SW-1 (Downstream)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	04/29/03
SW01MSPB	SW-1 (Downstream)	TSS, CI ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	04/29/03
SW01MSDPB	SW-1 (Downstream)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	04/29/03
SW02PB	SW-5 (Upstream)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	04/29/03
SW03PB	SW-6 (Lugar Creek)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	04/29/03
SW04TBPB	Trip Blank	VOCs	04/29/03

Table 6: GROUNDWATER CHEMISTRY DATA, APRIL 2003

IONITORNIG WELL	MB-1 BOTTOM	MB-2 TOP	MB-E TOP	MB-6 BOTTOM	MB-7 TOP	MB-8 BOTTOM	MB-0 TOP	MS-10 TOP	DUPLICATE (MB-1)
OCATION IN AQUIPER	50110M	109	107	BOTTOM	105	BOT TOM	107	, tor	(MM=1)
CL VOLATILES (ug/L)									
cetone	10 W	10 W	NA.	- NA	· NA	NA	NA	NA	10 W
enzene -	10 U	10 U	NA.	NA	NA	NA.	NA .	NA	10 W
hlorobenzana	10 U	0.8 3	NA	NA.	NA	NA.	NA	NA.	10 U
ital 1,2-Dichloroethene	7 J	10 U	NA	NA	NA	NA	NA	NA	7 J
ichloroethene	eo 1	10 U	NA	NA	NA	NA	NA.	NA.	71
nyl Chloride	10 U	2 J	NA	NA	NA	NA.	NA.	NA	10 U
arbon Disuffice	10 U	1 J	NA.	NA	. NA	NA.	NA.	NA	10 U
DLATILE TENTATIVELY IDENTITFIED COMPOUNDS (Retent one detected	ion Time) (1)								
CL SEMIVOLATILES (ug/L)									
s(2-Ethylhexyl)phthelate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U	10 U
pachiorocyclopentadiene	10 UJ	10 UJ	10 W	10 W	10 W	10 W	10 W	11 W	10 W
4-Dinitrophenol	25 W	24 W	R	R	R	R	24 UJ	11 W	25 W
projectern	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U	10 U
sthylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U	10 U
stophenone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.6 J	10 U
pthelene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 J	10 U
1'-Biohenyl	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.4 J	10 U
enenthrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.3 J	10 U
EMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Re	tention Time) (1)								
nknown	•••	22 J	38 J	52 J	2 J	257 J	25 J	17 J	
enol, tert-butyt-isomer		4 3						· ·	
tylated Hydroiotoluene								3 NJ	
ziadecencic Acid								11 NJ	
3H)-Benzothiezotone				8 NJ					
4,5,6,7,7-hexachloro-bicyclo(2-2-1)hept-5-ene-2,3-dicarboxylic s	icid	67 NJ							
ulfur		29 NJ	42 NJ				3 NJ		

Table 6: GROUNDWATER CHEMISTRY DATA, APRIL 2003

MONITORING WELL	MB-1	MB-2	MB-6	M9-4	MB-7	MB-4	MD-4	M8-10 DUP	LICATE (2)
LOCATION IN AQUIFER	DOTTOM	TOP	TOP	BOTTON	TOP	SOTTOM	TOP	TOP	(MB-1)
ISSOLVED TAL METALS (ug/L)									
dumininum.	40.9 U	40.9 U	57.9 U	45.3 U	40.9 U	64.8 U	52.7 U	42.4 U	40.9 U
Intimony	2.5 U	25 U	2.5 U	25 U	25 U	2.5 U	2.5 U	25 U	2.5 U
menic	6.0	77.7	33.4	122	84.1	118	6.2	22 U	6.5
arium	192	627	305	410	540	248	68.6	97	191
eryllium	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
admium	Q20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
alcium	119000	167000	98200	121000	68900	92700	57000	112000	119000
hramium	0.69 U	0.80 U	0.74 U	1.1 U	1.1 U	1,5 U	0.80 U	0.60 U	1,1 U
obalt	2.2 J	1.3 J	2.2 U	2.6 U	0.70 U	1.4 U	0.70 U	0.70 U	2.2
opper	1.6 U	1.6 U	1,6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
on	1670	28900	9410	18400	8300	10200	2210	55.2 U	1660
ed	1.4 W	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
agnesium	34000	39200	54700	30200	31400	72500	21900	35400	34000
langanese	928	266	184	79.2	67.4	109	488	3 U	927
leroury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
ickal	3.7 J	24 J	2.7	12.5	1.2 J	25 J	1.2 U	1.4 J	2.4 J
otassium	2330 J	11100	3610 J	9010 J	12700 J	18500 J	1200 J	2190 J	2340 J
elenium	23 U	23 U	2.3 U	2.3 U	23 U	3.1 J	2.3 U	23 U	2.3 U
lver .	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U
odkim	14500	19100	26200	18800	37000 J	60700	10100	15500	14600
hellum	2.9 W	29 W	29 W	29 W	29 W	29 W	29 W	2.9 W	2.9 U.
anadium	2.2 J	2.5	25 U	24 U	1.8 U	3.3 U	1.4 U	21 U	2.3
inc	1.5 W	1.5 W	1.5 W	1.5 UJ	1.5 W	1.5 UJ	1.5 W	1.5 W	1.5 W
IDIGATOR PARAMETERS (mg/L)									
mmonie-Nitropen	R	7.6	1.7	3.6	5.1	4.1	0.43	0.10 U	R
hemical Oxygen Demand	10.0 U	26.4 U	15.6 U	17.7 U	15.6 U	es U	10.0 U	10.0 U	10.0 U
hioride	22.9	21.3	20.9	17.8	20.8	39.7	14.0	27.8	21.8
ctal Suspended Solids	17.4	62.0	6.8	5.2	33.6	17.2	36.4	25.4	16.4
inter									10.4

NA - Not enalyzed; peremeter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision, Sampling locations, MB-3 and MB-4, removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

⁽¹⁾ Unknown Tentatively identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown phtalate) or individual compound (e.g., IH-Benzotriazole) are identified, those compounds are listed separately with concentration and data qualifier and are not included in the total number or total concentration. The unknown TICs were totaled to provide condensed summary information in the data table. Any questions reperting specific unknown TICs can be investigated in the data validation report.

Table 7: POND WATER CHEMISTRY DATA, APRIL 2003

BAMPLING LOCATION	OPPORTE POND	OFFRITE POND	CNETTE	CHEFFE PCHG	
OCATION IN MATRIX	ESTTOM(PVI-4)	TOP (PW-S)	SOTTON FW-D	TOP (PVII-1)	
TOL VOLATELES (Mg/L)				•	
NA.	NA.	- NA	NA.	NA.	
volatilis (issetativisly ii Va	CENTRAL COMPOUNDS (Financia) NA	NA NA	NA.	NA.	
•					
TCL SEMIVOLATILIES (Ne/L.) NOME DETECTED)			•	
MENOVOLATILE TENTATME VONE DETECTED	TA IDENLATED CONSCIUNDS (See	ration Three) (1)			
DISSOLVED TAL METALS (خاس				
Alumininum	NA NA	NA	NA.	21 U	
Aritmony	NA.	NA.	NA.	4.5 U	
Amenic	NA.	NA.	NA.	4.4 W	
Berkm	NA.	NA.	NA.	146	
Beryllium	NA.	NA NA	NA	0.10 U	
Cedmium	NA.	NA.	NA.	1.20	
Celdum	ŅĀ	NA.	NA.	45200	
Chromium	NA.	NA.	NA	0.70 LU	
Cobat	NA.	NA.	NA.	1.40 U	
Copper	NA.	NA.	NA.	8.80 J	
ron	NA.	NA.	NA.	19.2 U	
Lead	NA.	NA.	NA.	2.70 U	
Magnaskum	NA NA	NA NA	NA.	20000	
Marganase Marganase	NA NA	NA NA	NA.	7.80	
Mercury Nichel	NA NA	NA NA	NA.	0.10 U	
Potannium	NA NA	NA NA	NA.	8.5 U	
Politikum Selenium	NA NA		· NA	6960	
Silver	NA NA	NA NA	NA.	26 U	
sever Sodium	NA NA	NA NA	NA NA	0.80 U	
Socium Thelium	NA NA	NA NA	NA NA	16200	
rnaum Venedium	NA NA	NA NA	NA NA	7.0 W 1.0 U	
Zeresten Zinc	NA.	NA NA	NA NA	36.1	
NDICATOR PARAMETERS	(
MUNICA I CIR PARGUES I BRUS Ammonie-Nitrogen	NA NA	NA.	NA.	9.10 U	
Chamical Oxygen Demand	NA NA	NA NA	NA NA	0.10 U 17.7	
Chloride	X	NA NA	NA NA	17.7 17.1	
Total Suspended Solids	NA.	NA.	NA NA	17.1 6.4	
FIELD PARAMETERS					
Temperature (C)	· NA	NA.	NA.	22.5	
H	- ÑÃ	NA NA	NA.	22.5 8.03	
Conductivity (umboe/cm) (2)	- XX	NA NA	NA.	500	
Conductivity (umhoe/om) (3)	NÃ.	NA NA	NA NA	501	
Dissolved Glorgen (mart.)	N		, NA	7.4	
Notes:		180			

NA - Not enablesd; peremeter removed from water quality monitoring program as part of a condensed monitoring program following a ro-further-action Record of Declaion. Sampling locations, PW-2, PW-3, and PW-4, removed from water quality monitoring program as part of a condensed monitoring program following a ro-further-action Record of Declaion.

(1) Unknown Tertalityely Identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the compounds of unknown TICs. TICs for which a compound class (e.g., unknown phistale) or individual compound (e.g., 1H-Bencottazzle) are identified, those compounds are fetted separately with comparation and data qualifier and are not included in the total number or total compounds. The unknown TICs were located to provide conducted summitry information in the date table. Any questions regarding specific unknown TICe can be investigated in the date validation report.

(2) - field measured specific conductivity at emblent temperature

(3) - specific conductivity corrected to 25 degrees C.

ND - Not Detected

Table 8: SURFACE WATER CHEMISTRY DATA, APRIL 2003

	- 73	E	a Laboratoria	-	S ITAG	# CE10	2 5 5 5
LOCATION	Downstream	Adecent	Adjacent	A SPEC		Lugar Creek	SW-1)
TCL YOLATILES (ug/L)	8	₹ .	₹	₹	₹	₹	ક
VOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Passandon These	IHED COMPOUN	DS (Pasternition		Ē	Ž	£	5
TCL SEMIVOLATILES (ug/L)							
Caprolactam	3	₹	₹	3	2 3	ž	2
CO GREGINATI A LEMINATARI A ILLA KAMBES	KENTHER COME		andon Time) (1				
Unknown	8	₹.	*	3	8	ن .	š
DISSOLVED TAL METALS (up/L)	2	•	•	:	2	2	
Anthrony	450	₹ 3	₹ 3	₹ 3	450	450	A :0 C
Araenic	:	ξ	₹.	₹	.		1. E
Bartum	73.3	š	¥	₹	73.4	. ~	73.1
Codynam.	500	₹ 3	₹ ₹	F 3	9.10		0.00
Calcium	74200	₹	₹ :	F	75100	90100	74400
Chromium	0.70 U	₹	₹	Ĕ	0.70 W		0.70
Cooper	23 J	₹ ;	₹ ?	₹ 3	23 U	230	25.0 U
्रह	19.2 U	₹	₹	3	19.2 U		19.2 U
Magnasium	31800	₹ 3	₹ ₹	3	37100	·4	31700
Manganose	202	₹	₹	₹	18.2		19.0
Nickel	3.9 0	₹ 3	₹ ₹	₹ 3	2.0 0	2.40 C	1.9 C
Potassium	2470	₹	ξ	¥	2350		2450
Selenium	5.0 (₹ ₹	₹ ₹	£	2.6 (2.6 U	2.6 0
Sodium	20100	₹ :	₹ :	₹ :	19700	22	N
Theilium	7.0 UJ	₹	₹	¥	7.0 U		7.0 W
Vanedium Zinc	3 .c	₹ ₹	\$ \$	₹ ₹	3 10 C	3 . C	
PANCATOD DADAMSTEDS (mod)	-	į	;	;	;		
Ammonie-Nitrogen	0.10	₹	₹	£	0.10 U	0.10 U	0.10 U
Chemical Oxygen Demend	10.0 U	ξ	₹	₹	10.0 U		10.0 U
Chloride Total Suspended Solida	41.2	3	₹ ₹	5 ₹	3 6 3	53.0 0	40 50 50
	į	į	į	;	į	!	i
Transport Co	3	2	2	5	٠ •	3	ن د د
PH PHONE TO SERVICE TO	8.10	₹ !	₹ :	₹ :	8.36	9.29	8 1 20
Conductivity (umhos/cm) (2)	8	ξ	₹	¥	800	720	6 00
Conductivity (umhos/cm) (3)) 26 37	ξ	₹	₹	820	745	8
Notes:	20.4	3	3	3	4.00	0.13	***
NOME:							

NA - Not analyzed; perameter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

Sampling locations, SW-2, SW-3, and SW-4, removed from water quality monitoring program as part of a condensed monitoring program.

RR - Not recorded

ND - Not Detected

(1) Unknown Testatively Identified Compounds (TCs) are summed or totaled by the number of unknown TCs and by the concentration of unknown TCs. TCs for which a compound class (e.g., unknown phalate) or individual compound (e.g., 11H-Benzolstazole) are identified, those compounds are listed expertisely with concentration and data compound (e.g., 11H-Benzolstazole) are identified, those compounds are listed expertisely with concentration and data conducted in the total number or total concentration. The unknown TCs were totaled to provide conducted in the total number or total concentration. The unknown TCs can be investigated in the data validation report.

(2) - field measured apacific conductivity at ambient temperature (3) - specific conductivity corrected to 25 degrees C.

TABLE 9: WATER QUALITY CRITERIA - UPDATED 2000

	Acute		Chronic						
	Aquatic		Aquatic		Human			•	
arameter	Criteria		Criteria		Health		MCL		
CL Volatiles (ug/L)	,								
cetone	10000	+	222	+					
	5300	E	118	•	400		5	E	
hiprobenzene	1960	÷	50	E	2026	+		_	
2-Dichloroethene (total) (1)		•		_			70 and 100	F	
ethylene Chloride	193000	E	4289	+	157	£		•	
othere	17500	Ē	369	•	424000		1000	E	
chbroethene	45000	Ē	21900	Ē	807	i	5	Ē	
nyl Chloride		-		_	5246	i	2	Ē	
nyi Chionde					5240	•	2	-	
Z. Semivolatiles (ug/L)									
nenol	10200	E	2580	E	3500	Ε			
Mainte Esters	940	Ē	3	Ē		ī			
		-	-	_					
il. Metals and Cyenide (ug/L)									
uminum							••		
ntimony	••				45000	1	6	E	
enic .	360	1	190	ì	0.175	1	50	E	
rium			••		••		2000	E	
nyffum			•-		1.17	!	4	E	
ndrnium*	6.7	1	1.6	1	60	+	5	E	
ulckum	••						• •		
romium	16	1	11	1	3389	+	100	E	
belt			• •		••		••		
opper* (2)	28	1	18	1	••		1300	E	
penide	22	1	5.2	1	24242	+	200	Ē	
n	1000	E	• •		••		••	_	
red" (2)	150	Ī	5.8	1	51	+	15	E	
ngnesium	••		••				••	_	
anganese					•••				
ercury	2.4	1	0.012	1	0.15	F	2	E	
ckel"	2100	i	240	i	100	i	100	Ē	
deskim				•		•		-	
Mentum	130	1	25	1			50	E	
Mar ^a	9.2	i	0.12	Ė			50	Ē	
odium	•••	•	V.12	-				_	
nellum			- :-		48	t	2	E	
enedium	11000	•	100	+		•		_	
nc*	175	ř			••				
ie.	1/5	•	160	1					
EM Parameters (mg/L)									
mmonia, Total Unionizad**	0.027	ı	0.0029	Į					
00	••								
hioride	860	1	230	1	• •				
SS		-		•					

"Acute and chronic criteria calculated based on worst-case hardness=161 mg/L.

-- Criterie not developed

MCL - Maximum Contaminant Level (Updated per the Safe Drinking Water Act of 1985 and later revisions known as the Phase II, Phase III, and Phase V rules.

Phase I became affective January 9, 1989, Phase II became effective in 1992, and Phase V became effective January 17, 1994.) Source of Data

E - U.S. EPA

1 - IDEM (327 IAC 2)

+ - See section 6.2 of February 1990 report by Beek Consultants Limited Beseine Water Quality Conditions for discussion of sources for the criteria.

(1) The 1,2-Dichtoroethene MCL standards are divided into cis-1,2-Dichtoroethene at 70 ug/L and trains-1,2 Dichtoroethene at 100 ug/L.

(2) - The "MCL" value is an action level for lead and copper (i.e., the lead and copper rule) but it only applies to water supplies.

as measured at the household tap.

^{**}Acute and chronic criterie calculated based on worst-case t=5C, pH=7.0

TABLE 10: CALCULATED ACUTE AQUATIC CRITERIA AND CHRONIC AQUATIC CRITERIA FOR AMMONIA-NITROGEN, APRIL 2003

Sample	Well		Temp	Total Ammonia in Sample	Calculated Un-ionized Ammonia (in Sample)		Un-ionized riteria (mg/L)**	Critu Exc	oria seded
Matrix	Number	pН	(C)	(mg/L)	(mg/L)*	AAC	CAC	AAC	CAC
Ground Water	MB-1	7.4	14.0	R	Ř	0.091	0.0145	R	R
	MB-2	6.9	15.0	7.6	0.0158	0.044	0.0044	No	Yes
	MB-5	7.2	14.5	1.7	0.0076	0.074	0.0095	No	No
	MB-6	7.0	14.5	3.6	0.0088	0.049	0.0053	No	Yes
	MB-7	7.1	15.5	5.1	0.0178	0.064	0.0074	No	Yes
	MB-8	7.2	15.0	4.1	0.0185	0.076	0.0096	No	Yes
	MB-9	7.7	13.5	0.43	0.0057	0.117	0.0288	No	No
	MB-10	7.2	13.0	0.10 U	0.0002	0.067	0.0088	No	No
	Duplicate+	7.4	14.0	R	R	0.091	0.0145	R	R
Pond Water	On-site (S)	8.0	22.5	0.10 U	0.0024	0.257	0.1044	No	No
Surface Water	SW-1	8.2	23.0	0.10 U	0.0036	0.283	0.1563	No	No
	Duplicate++	8.2	23.0	0.10 U	0.0036	0.283	0.1563	No	No
	SW-5	8.4	21.0	0.10 U	0.0044	0.257	0.1967	No	No
	SW-6	9.3	21.0	0.10 U	0.0227	0.283	1.7133	No	No

^{* -} Values calculated according to the Indiana Register (1990) (327 IAC 2). Unionized values calculated using 1/2 the detection limit for less than detection limit total results.

^{** -} Calculated according to the USEPA Quality Criteria for Water, 1986 EPA 440/5-86-001(se revised by Water Quality Criteria and Standards Activity Report, August 1992)

^{+ -} Readings taken from monitoring well MB-1

^{++ -} Readings taken from surface water sample location SW-1.

AAC - Acute Aquetic Criteria

CAC - Chronic Aquatic Criteria

TABLE 11: ACUTE AQUATIC CRITERIA AND CHRONIC AQUATIC CRITERIA FOR TAL METALS CONCENTRATIONS DEPENDENT ON HARDNESS, APRIL 2003

					Ċ	draken (we/L)		Ç		(uw)L)			Cep	per ty	41		Lees	(well)			Nite	el (ue/L)		Meer (s	A)			Zinc (u	ig(L)	_
Semple Matrix	Sample Location	Herstroon (mg/L)	Calclum (mg/L)	Magreelett (mg/L)	Conc.**	*	c- 04	AC. Cou	c."	MC	CAC	Sample Cons."		MC.	CAC	Sample Conc.**		AAC*	CAC	Sample Come."		AAC-	CAC	Bample Cosc.**		AAC*	GAC(1)	Sample Conc.**		AAC"	CAL
lesolved Met						Marie Charles		hand desire	are to do											et a nacional											_
round Water		437.4	119.0			Carrie Carrie	e a mortific			5416		ાં જા લ ્ડા 1 ક	والم المتعادة	el .	42	والمناسبة المسامة		334 334	THE STATE	1.7	S 42	4943			U	51		1.6	w	400	371
COTTUG AARMEL	MB-2	570.8	167.0	34.0 30.2	0.20	U 2		5 0		7315	872	1.0	ä	/1	42	1.4	w,	763	- 41	2.4	- 1	6264	-	0.90 0.90	ŭ	31 83			ü	518	400
	MB-2	470.6	96.2	- 64.7	0.20	U 2				6174	738	1.0		78	44	1.4		586	23	2.7	•	5254		0.90	ü	64		1.5		435	30
		428.8	121.0	30.2	0.20	U 2		1	-	5000	679	1.6	×	70	77	1.4	×	518	20	12.5		4841	538	0.90	ü	40		1.5	w	400	
	MB-6	361.6	88.9	31.4	0.20					4001	579	1.6		56	36	1.4	ü	404	20	1.2		4107	457	0.90	ü	**		1.5	w		363
	MB-7			72.6	0.20			3 1		6007	811	1.6	ü	-	30				27	2.6	•	5815			ű	30		1.5	w	339	307
	MB-8	630,1	92.7		0.20	U 2		1.		3487	413				24	1.4		882	21				846	0.90	ŭ	71		1.5	w	481	430
	MD-0	232.6	57.0	21.9	0.20	U 10		2 0		3407		1.8		-	24	1.4		230		1.2	Ų	2007	322	0.90		17		1.5	w	230	217
	MB-10	425.7	112.0	36.4	0.20	U 2				206/	678	1.0	U	•	41	1.4	U	516	20	1.4		4830	637	0.90	U	49		1.5	w	399	36
	Duplicate +	437.4	119.0	34.0	0.20	U 2		• 1	1 U	5815	683	1.6	U	71	42	1.4	· ·	534	21	2.4	J	4943	549	0.90	U	51		1.5	w	409	37
Maria de la compansión de	30 m	and the second	. Millian	وأماأ كالوراء وعالمه		والمعارض والمعارض	i en en de l		ALPA.		-7.00		ه ښد راکه	سلام الأس		or in the first.	41.00	e 12. 14.	المدندة ومرا	1134 12	in the	Sec 25.1			A comme		4.				
	On-eite (8)	223.3	45.2	28.8	1.2	. 10		2 0		3363	400	0.0	J	36	23	2.7	U	221		5.5	U	2798	311	0.80	U	16		36.1		231	20
4.28	Sales Sales	Sand Section	him little here		in a Skyline	war the same		والمتلفظة المدر	Land State		المحكيد أالا	منياز لا الا			ંદ' જુ	الثبتي منتف	arest i	1111	as timeste	مستنفظ للتنفا	Lech.		بالإنجازة معلو	رفينوه أألمط		1.11					
rfece Weter	8W-1	315.1	74.2	31.5	5.0	U 14	, ,	0.		4446	\$30	2.3	J	52	32	R		352	14	3.9	U	3746	418	0.00	Ü	20		0.5	U	309	260
	Duplicate++	316,5	74.4	31.7	0.40	W 14	1 3	3 0.		4461	632	28.0	U	52	32	R		384	14	1.9	U	3768	418	0.80	U	29		8.5	U	311	281
	3W- 5	319,8	75.1	32.1	0.40	W 10	, ;	3 0.		4500	536	2.3	U	53	32	2.7	U	380	14	2.9	υ	3783	422	0.80	U	30		8.5	U	313	284
	SW-6	363.1	90.1	33,5	0.40	W 1		9 0.	<u>w</u>	4963	506	2.3	<u> </u>	- 60		2.7	<u> </u>	422	16	2.4	U	4222	460	9.80	U	37		6.5	Ų	349	310
		concentral Aquatic Ca do Aquatic e comple or to semple of	ions are up iteria Criteria dected from collected from	y'L (ppb) m moreturing	tegister (1990) well MB-1. water nerripling is																										

TABLE 12: SAMPLING LOCATIONS EXCEEDING APPLICABLE WATER QUALITY CRITERIA, APRIL 2003

Parameter	Matrix	Sample Location	Monitoring Well Zone (1)	Sample Concentration (ug/L)	Criterion Exceeded	Criterion Concentration (ug/L)	Source	Average (1) Concentration Of Zone (ug/L)	Exceeds Criterion	Concentration After Mixing (ug /L) (2)	n Exceeds Criterion
TCL Volatiles (ug/L)	MEUIX	FOCTOOL	20110 (1)	(ugr.)	LACOSOG	(042)	300100	OI ZUITE (USP L)	CHUSTION	(m) (m)	GIREIROII
Trichloroethane	Groundwater	MB-1	1	60	MCL	5	E	33	Yes	0.02	No
Trichloroethane	Groundwater	Duplicate	i	71	MCL	5	Ē	38	Yes	0.02	No
Dissolved TAL Metals						•					
Arsenic	Groundwater	MB-1	l l	6.0	нн	0.175	ı	41.9	Yes	0.02	No
Arsenic	Groundwater	MB-2	1	77.7	HH	0.175	ı	41.9	Yes	0.02	No
Arsenic	Groundwater	MB-5	ti -	33.4	HH	0.175	i	77.7	Yes	0.04	No
Arsenic	Groundwater	MB-8	Ü	122	· HH	0.175	1	77.7	Yes	0.04	No
Arsenic	Groundwater	MB-7	111	64.1	HH	0.175	1	91.1	Yes	0.05	No
Arsenic	Groundwater	MB-8	Ħ	118	HH	0.175	ı	91.1	Yes	0.05	No
Arsenic	Groundwater	MB-9	NA	6.2	HH	0.175	1	_		_	_
Arsenic	Groundwater	Duplicate	1	6.5	HH	0.175	1	41.9	Yes	0.02	No
Arsenic	Groundwater	MB-2	1	77.7	MCL	50	Ε	41.9	No	0.02	No
Arsenic	Groundwater	MB-6	Ħ	122	MCL	50	Ε	77.7	Yes	0.04	No
Arsenic	Groundwater	MB-7	H	64.1	MCL	50	E	91.1	Yes	0.05	No
Arsenic	Groundwater	MB-8	Ht	118	MCL	50	Ε	91.1	Yes	0.05	No
iron	Groundwater	MB-1	1	1670	AAC	1000	E	14285	Yes	8	No
Iron	Groundwater	MB-2	1	26900	AAC	1000	E	14285	Yes	8	No
Iron	Groundwater	MB-5	11	9410	AAC	1000	E E	12905	Yes	7	No
Iron	Groundwater	MB-6	8	16400	AAC	1000	E	12905	Yes	7	No
Iron	Groundwater	M8-7	III	8300	AAC	1000	Ε	9250	Yes	5	No
Iron	Groundwater	MB-8	lH	. 10200	AAC	1000	Ε	9250	Yes	5	No
Iron	Groundwater	MB-9	NA	2210	AAC	1000	Ε	_			-
iron	Groundwater	Duplicate	1	1660	AAC	1000	Ε	14285	Yes	8	No
indicator Parameters				(mg/L)		(mg/L)		(mg/L)		(mg/L)	
Unionized	Groundwater	MB-2	ı	0.0158	CAC	0.0029	E	0.0079	Yes	0.000004	No
Ammonia (mg/L)	Groundwater	MB-5	- II	0.0076	CAC	0.0029	E	0.0082	Yes	0.000005	No
	Groundwater	MB-6	II	0.0088	CAC	0.0029	Ε	0.0082	Yes	0.000005	No
	Groundwater	MB-7	116	0.0178	CAC	0.0029	Ē	0.0182	Yes	0.000010	No
	Groundwater	MB-8	111	0.0185	CAC	0.0029	Ē	0.0182	Yes	0.000010	No
	Groundwater	MB-9	NA.	0.0057	CAC	0.0029	E			_	-

AAC - Acute Aquatic Criteria
CAC - Chronic Aquatic Criteria

Duplicate - Duplicate sample collected from monitoring well MB-1

NA - Not applicable; sampling location is not included in the monitoring zone calculations.

HH - Human Health Criteria
MCL - Maximum Contaminant Level

⁽¹⁾ Refer to the Environmental Resources Management (ERM) Remedial Action Plan for Marion (Bragg) Landfill Site, Marion, Indiana, dated 1989, for definition of monitoring well zones and concentration calculations. Monitoring well zone I will consist of MB-1 and MB-2 with condensed monitoring program, since MB-3 and MB-4 have been removed from the sampling program.

⁽²⁾ Refer to the Camp, Dresser, and McKee (CDM) Remedial Investigation Report, dated 1987, for mixing zone calculations.

APPENDIX A Chain-of-Custody Forms

501 Madison Avenue Cary, NC 27513

CHAIN-OF-C	CUSTODY RECORD	No. 65173 1 4 5
Project Name :	Client Address : ()	Point-of-Contact:
ligren bure	36 11 1 10 10	<u> </u>
Carrier: Faction	De all to all	Telephone No. : 11 11 11 11 11 11 11 11 11 11 11 11 1
Airbill No.: San July Colling & Collins		Sampling complete? Y or N (see Note 1)
Sampler Name: (6) (2 a / 1 a / 2 a /	Sampler Signature :	Project-specific (PS) or Batch (B) QC ?

			1-8	300	-83	33-5	509	97				_					<u> (C. 1. j.</u>				 					,	4	- `				_				ompiete? \		 	
, , , , , , , , , , , , , , , , , , , 													ample	$\overline{}$			1				Samp						J.	<u>- O</u>							рес	ific (PS) or I	3atch (F	3) QC (?
BOX #1		2. 0	Grou	ace ind :hat	Wa				6. 1 7. 0 8. V) Dii	Blank	(BC		A. HCI B. HNO C. NaO		G.	ice Or Other	·		вох	K3		Filter Unfil	ed tered	ı		Box	. #4		H. I M. I L. L	Med		ì		. CLP 3/9 . SW-846 /. CWA 6	5	T. TCLF
		4. F	tins	ate			/ S		9. C		er <u>fa</u>	ıH	<u>t.b</u> . (<u> </u>		D. H2S	04 + Ice eserved	1. 2	ZnAc+	NaOH -	lce	<u> </u>). Other_		
(9 c	ha			ple rs ı			านเ	m)			Date:Year_a CC_2		Time		Matrix	Preservative Box #5	Filtered / Unfiltered Box #3	В	Expected Conc. x	Wethod We	No. of Bottles	Use for Lab QC	VOA	svoc	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	(1)		10.1	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		arks / ee Note		
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* Can I Go I how Lab: Received in Good Condition? Y or N Describe Problems, If any: #3 Relinquished By: (Sig) Date: " #2 Relinquished By: (Sig) Date: #1 Relinquished By: (Sig) Date: Time: 18: C Company Name: Time: Company Name: Time: Company Name: 🤇 #2 Received By: (Sig) Date: #3 Received By: (Sig) Date: Date: #1 Received By: (Sig) Company Name: Time: Company Name: Time: Time: Company Name:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now. Note (2): Samples stored 60 days after date report mailed at no extra charge.

Note (3): All lab copies of data destroyed after three years.

COMPUCHEM
a division of Liberty Analytical Corp.

CHAIN-OF-CUSTODY RECORD

No. 55170 14 3

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Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now. Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

COMPUCHEM
a division of Liberty Analytical Corp.

CHAIN-C	OF-CUSTODY RECORD	No. 55174 3.4
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Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.

Company Name:

Note (2): Samples stored 60 days after date report mailed at no extra charge.

Company Name:

Time:

Note (3): All lab copies of data destroyed after three years.

Company Name:

Time:

Time:





Login Chain of Custody Report (In01)

May. 01, 2003

05:53 PM

Login Number: RZ1067

Account: O & M

O & M

Project: MARION BRAGG

Case: Q1067

Labora	tor	v Client	,	Collect	Receive		Due	
Sample			Number	r Date	Date	PR	Date	Comments
RZ1067-1		GW09FBF	В	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water		S AMMONIA (AS N)	Hold:	28-MAY-03	plastic liter	1	Bottles	
Water		S CHLORIDE	Hold:	28-MAY-03	plastic liter	1	Bottles	
Water		S METALS-DISS-ILM	104.0 Hold:	28-MAY-03	plastic liter	1	Bottles	•
Water	:	S SVOA-OLM04.2	Hold:	06-MAY-03	amber liter	2	Bottles	
Water	;	S TS\$	Hold:	07-MAY-03	plastic liter			
Water	5	S VOA-OLM04.2-5ML	Hold:	11-MAY-03	40ml vial	3	Bottles	
RZ1067-2		GW07PB		30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	5	AMMONIA (AS N)	Hold: ;	28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: ;	28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM	04.0 Hold: :	28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04 2	Hold: (06-MAY-03	amber liter	2	Bottles	
Water	S	TSS	Hold: (07-MAY-03	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold: 1	11-MAY-03	40ml vial	3	Bottles	
Z1067-3		GW08PB		30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**USE FOR QC
Water	s	AMMONIA (AS N)	Hold: 2	28-MAY-03	plastic liter	3	Bottles	•
Water	S	CHLORIDE	Hold: 2	28-MAY-03	plastic liter	3	Bottles	
Water	S	MEȚALS-DISS-ILMO	14.0 Hold: 2	8-MAY-03	plastic liter	3	Bottles	·
Vater	S	SVOA-OLM04.2	Hold: 0	6-MAY-03	amber liter	6	Bottles	
Vater	s	TSS	Hold: 0	7-MAY-03	plastic liter			
Vater	S	VOA-OLM04.2-5ML	Hold: 1	1-MAY-03	40ml vial	9	Bottles	
21067-4		GW08DPPB		30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Vater	s	AMMONIA (AS N)	Hold: 28	B-MAY-03	plastic liter	1	Bottles	
Vater	s	CHLORIDE	Hold: 28	B-MAY-03	plastic liter	1	Bottles	
Vater	s	METALS-DISS-ILMO	4 0 Hold: 28	8-MAY-03	plastic liter	1	Bottles	
Vater	s	SVOA-OLM04.2	Hold: 06	5-MAY-03	amber liter	2	Bottles	
/ater	S	TSS	Hold: 07	7-MAY-03	plastic liter			
/ater	s	VOA-OLM04.2-5ML	Hold: 11	I-MAY-03	40ml vial	3	Bottles	
1067-5		GW01PB		30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
/ater	s	AMMONIA (AS N)	Hold: 28	3-MAY-03	plastic liter	1	Bottles	
/ater	S	CHLORIDE	Hold: 28	B-MAY-03	plastic liter	1	Bottles	
/ater	s	METALS-DISS-ILM04	.0 Hold: 28	3-MAY-03	plastic liter	1	Bottles	
ater	s	SVOA-OLM04 2	Hold: 06	-MAY-03	amber liter	2	Bottles	
ater	s	TSS	Hold: 07	-MAY-03	plastic liter			

Signature :

Date : _

89

Page: 1 of 2





Login Chain of Custody Report (In01)

May. 01, 2003 05:53 PM

Login Number: RZ1067

Account: O & M

O & M

Project: MARION BRAGG

Q1067

Labora Sample			ie Numbe	Collect r Date	Receive Date	PF	Due R Date	Comments '
R Z 1067-6		GW02PE	3	30-APR-03	01-MAY-03	9	14-MAY-03	B PPS 489
Water		S AMMONIA (AS N	i) Hold:	: 28-MAY-03	plastic liter		1 Bottles	
Water		S CHLORIDE	Hold:	: 28-MAY-03	plastic liter		f Bottles	
Water		S METALS-DISS-IL	_M04.0 Hold:	28-MAY-03	plastic liter		Bottles	•
Water	:	S SVOA-OLM04.2	Hold:	06-MAY-03	amber liter	2	Bottles	
Water	;	STSS	Hold:	07-MAY-03	plastic liter			
RZ 1067-7	_	GW03PB		30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**LOW VOLUME
Water	5	S AMMONIA (AS N) Hold:	28-MAY-03	plastic liter	1	Bottles	
Water	5	CHLORIDE	Hold:	28-MAY-03	plastic liter	1	Bottles	
Water	5	METALS-DISS-IL	M04.0 Hold:	28-MAY-03	plastic liter	1	Bottles	
Water	5	S SVOA-OLM04.2	Hold:	06-MAY-03	amber liter	1	Bottles	
Water	S	TSS	Hold:	07-MAY-03	plastic liter			
Z1067-8		GW04PB		30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Vater	s	AMMONIA (AS N)	Hold: ;	28-MAY-03	plastic liter	1	Bottles	
Vater	S	CHLORIDE	Hold: 2	28-MAY-03	plastic liter	1	Bottles	
Vater	S	METALS-DISS-ILM	//04.0 Hold: 2	28-MAY-03	plastic liter	1	Bottles	
Vater	S	SVOA-OLM04.2	Hold: (06-MAY-03	amber liter	2	Bottles	
Vater	S	TSS	Hold: (07-MAY-03	plastic liter			·
21067-9		GW05PB		30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Vater	s	AMMONIA (AS N)	Hold: 2	28-MAY-03	plastic liter	1	Bottles	•
/ater	s	CHLORIDE	Hold: 2	28-MAY-03	plastic liter	1	Bottles	
/ater	S	METALS-DISS-ILM	104.0 Hold: 2	8-MAY-03	plastic liter	1	Bottles	
/ater	S	SVOA-OLM04.2	Hold, 0	6-MAY-03	amber liter	2	Bottles	
ater	S	TSS	Hold: 0	7-MAY-03	plastic liter			
1067-10		GW06PB		30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
ater	s	AMMONIA (AS N)	Hold: 2	8-MAY-03	plastic liter	1	Bottles	
ater	S	CHLORIDE	Hold 2	8-MAY-03	plastic liter	1	Bottles	
ater	s	METALS-DISS-ILM	04.0 Hold: 20	8-MAY-03	plastic liter	1	Bottles	
ater	s	SVOA-OLM04.2	Hold: 0	6-MAY-03	amber liter	2	Bottles	
ater	S	TSS	Hold: 07	7-MAY-03	plastic liter			
1067-11		GW01TBPB	, , , , , , , , , , , , , , , , , , , 	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**TRIP BLK
ater	s	VOA-OLM04.2-5MŁ	Hold: 11	1-MAY-03	40ml vial	3	Bottles	

Signature :

Date:

90

Page: 2 of 2

30

COMMERCIAL RECEIVING LOG PPS/RFA 489 Rec'd Date: 5-1-03 Client: COD Subject to CTT Jew Est Project: Courier: 1,106 Duote: Airbill No. \$253 6077 9080 _ogin No. Subcontract? TAT Verbal 13 das Cooler Rec'd By: **Parameters** Sample Login By: Temperature: Cvanide Samples checked for sulfide & chlorine? Phenol Samples checked for chlorine? Received in Good Condition? If no, explain: 00 CompuChem Client ID Matrix No. & No & No. & No. & No & Date Military No & No. & p H р Н No. & PH ID Туре Type H Type H Type Type Type Type Н Type С 2003 Time PB WA 04 29 15.10 3,251212 DPPB 15-10 1.250FL 02 PB -4 03 PW 01 6W 097B 11:30 cl 03 09:45 10:15 11 00 06 13 20 14:00 3.250PL 14:00 11250PL $\overline{\infty}$ Container Type Abbreviations 40mL(40ml yeal) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) 41 - 6/28/01 dec

			COMM	ERCIAL RECEIV	ING LOG.	\
Client:	Of Make		Rec'd Date:	5-1-03	PPS/RFA 487	
Project:	Marion	Bross	Courier: 4	EL		ructions
Quote: 'V 1010	067, 871067	00	Airbill No. 32	53 6077 4050	223	
Subcontract?	2017 1001					
TAT Verbal	Report 13					
TAT Veloai	Report 13 (Y	ino				
		•		Į.		
Cooler Rec'd By		the		r 		
Sample Login B					Parameters	
Temperature:	2°0 26					
Cyanide Sample	s checked for sulfide &	chlorine? Y / f	ÑA			
Phenoi Samples	checked for chlorine?	Y / (NA)				
Received in Goo	od Condition? (Y)	N		i i		
If no explain:						
					1 CL	
CompuChem	Client ID			voe svoe	netela annova 755	
נוו		Q Matrix C	Date Military 20 03 Time	No. & p No. & Type	p No. & p No. & p No. & p	No. & p No & p No & p
RX1067-1	5WOIPB			 		Type H Type H Type H
- 2		- Wish	k ' /	9.40ml 6.AL	3.9L 12 3.7L 12 3.9L	
- 3	OIDPPI	2	15 10	3,4000 2,AL	1.PL 11.PL 1 1.P/	
-4	02 PB	++++	1/1/1/1/1/5			
}	03		1/2/20	_ \		
-le	V CATBPE	$1 \mid 1 \mid T$, , ,	340AD -		
-5	rw or PB		1/29 16 20			
<u> </u>	EW GREBPE	3		2.AL	1. PL (2 1. PL +2 1. PL	
- 11	(1073 PK		, ,	3:40 ml	+ + 4 4 4	
-5	0188		11.65	V -		
-6	02		08 20	- 2.AL	1.PL-2 1.PL 22 1.PL	
-7		+-+	109:00			
-8	03		109:45	I I AL		
-8	04		1 10:5	- 2.AL		
·	05		11:00	_		
-10	06				╼╂┈┼┼╫╼╁╼╁╁╼╌╁╌	
-21	07	1-1-1-	1145			
~ 3		+ - + - +	3.30	3 talvely	VYV	
-4	08/	-	1 14:00	4.40 dvine 6. AL		
-	08066	Y W		340AL 29AL	1. PLVI. PLVI. PL	1
∞	(co) cos	+	/		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
ω			/ :	// //)ng	5/16	
				- VIVO		
Container Type	Abbreviations 40mf (40m), x	(1) 4/4-5-7				
		ALLAMber Lite	er) PL(Plastic Liter) 50	00P(500mL Plastic) 250P(2	50mL Plastic) OTHER	H1 - 6 28/01 dee

Internal Chain of Custody

RAW SAMPLE

Laboratory:

Wetchem

Matrix: H2 C

Request Date:

5/6/03

Comments:

	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
1	RZ1067-1	5/1/03	AMMONIA (AS N)	H2504	of
2	RZ1067-2	5/1/03	AMMONIA (AS N)	7.04) of)
3	RZ1067-3 \	5/1/03	AMMONIA (AS N)		300
4	RZ1067-4	5/1/03	AMMONIA (AS N)		of
5	RZ1067-5	<i>/</i> 5/1/03	AMMONIA (AS N)		0
6	RZ1067-61/	5/1/03	AMMONIA (AS N)		101
7	RZ1067-7	5/1/03	AMMONIA (AS N)		of
8	RZ1067-8	5/1/03	AMMONIA (AS N)		of
9	RZ1067-9	5/1/03	AMMONIA (AS N)		of
10	RZ1067-10\	5/1/03	AMMONIA (AS N)		of
11					of
12					of
13					of
14					of
15					of
16					of
17					of
18					of
19					of
20					of

Relinquished By:	Received By:	Date: 5/6/03	Time: 6.40
Relinquished By:	Received By: columbia	Date: 5-6-03	Time: 16:15
Relinquished	Received		
By:	By:	Date:	Time:

Internal Chain of Custody

RAW SAMPLE

Laboratory:

Wetchem

Matrix: H₂ 0

Request Date:

5/5/03

Comments:

	2011	D	A	December	
	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only,)
1	RZ1067-1	5/1/03	CHLORIDE	NONE	of
2	RZ1067-2 🗸	5/1/03	CHLORIDE		of
3	RZ1067-3	5/1/03	CHLORIDE		20f 3
4	RZ1067-4	5/1/03	CHLORIDE		55 of
5	RZ1067-5 L	5/1/03	CHLORIDE		of
6	RZ1067-6 V	5/1/03	CHLORIDE		of
7	RZ1067-7	5/1/03	CHLORIDE		of
8	RZ1067-8	5/1/03	CHLORIDE		of
9	RZ1067-9 🗸	5/1/03	CHLORIDE		of
10	RZ1067-10	5/1/03	CHLORIDE	<u> </u>	of
11	·				of
12					of
13					of
14					of
15					of
16					of
17					of
18					of
19					of
20					of

Relinquished By:	Received By:	Date: 5/5/03	Time: 8-45
Relinguished By:	Received By: cools 1	Date: 5/5/05	Time: 6:50
Relinquished	Received		
Ву	By:	Date:	Time:



Login Chain of Custody Report (In01)

May. 01, 2003

05:34 PM

Login Number: RX1067

Account: 0 & M

O & M

Page: 1 of 1

Project: MARION BRAGG

Case: Q1067

Laborato	ory	Client	,	Collect	Receive		Due	
Sample I	Nur	nber Sample N	lumbe	r Date	Date	PR	Date	Comments '
RX1067-1		SW01PB		29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**USE FOR QC
Water	s	AMMONIA (AS N)	Hold	: 27-MAY-03	plastic liter	3	Bottles	
Water	S	CHLORIDE	Hold	: 27-MAY-03	plastic liter	3	Bottles	
Water	s	METALS-DISS-ILMO	4.0 Hold:	27-MAY-03	plastic liter	3	Bottles	•
Water	s	STORAGEBLK	Hold:	;	storageblk(40mlvial)	2	Bottles	•
Water	s	SVOA-OLM04.2	Hold:	06-MAY-03	amber liter	6	Bottles	
Water	s	TSS	Hold:	06-MAY-03	plastic liter			
Water	s	VOA-OLM04.2-5ML	Hold:	11-MAY-03	40ml vial	9	Bottles	
RX1067-2		SW01DPPB		29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	s	AMMONIA (AS N)	Hold:	27-MAY-03	plastic liter	1	Bottles	
Water	s	CHLORIDE	Hold:	27-MAY-03	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04	4.0 Hold:	27-MAY-03	plastic liter	1	Bottles	
Water	s	SVOA-OLM04.2	Hold:	06-MAY-03	amber liter	2	Bottles	
Water	s	TSS	Hold:	06-MAY-03	plastic liter			
Water	s	VOA-OLM04.2-5ML	Hold:	11-MAY-03	40ml vial	3	Bottles	
XX1067-3		SW02PB		29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	s	AMMONIA (AS N)	Hold:	27-MAY-03	plastic liter	1	Bottles	
Water	s	CHLORIDE	Hold:	27-MAY-03	plastic liter	1	Bottles	•
Water	s	METALS-DISS-ILM04	.0Hold:	27-MAY-03	plastic liter	1	Bottles	
Water	s	SVOA-OLM04.2	Hold:	06-MAY-03	amber liter	2	Bottles	•
Water	s	TSS	Hold:	06-MAY-03	plastic liter			
RX1067-4		SW03PB .		29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	s	AMMONIA (AS N)	Hold:	27-MAY-03	plastic liter	1	Boltles	
Water	s	CHLORIDE	Hold:	27-MAY-03	plastic liter	1	Bottles	
Nater	S	METALS-DISS-ILM04	.0Hold: ;	27-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: (06-MAY-03	amber liter	2	Bottles	
Nater	S	TSS	Hold: (06-MAY-03	plastic liter			
X1067-5		PW01PB		29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Vater	s	AMMONIA (AS N)	Hold: ;	27-MAY-03	plastic liter	1	Bottles	
Vater	s	CHLORIDE	Hold: 2	27-MAY-03	plastic liter	1	Bottles	
Vater	S	METALS-DISS-ILM04	0 Hold: 2	27-MAY-03	plastic liter	1	Bottles	
Vater	S	SVOA-OLM04.2	Hold: (06-MAY-03	amber liter	2	Bottles	
Vater	S	TSS	Hold: (06-MAY-03	plastic liter			
X1067-6		SW04TBPB		30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**TRIP BLK

Signature:

Date:

CUMPUCHEIVE & DIVISUR OF DECELOS CALLED STEEL COMMERCIAL RECEIVING LOG PPS/RFA 489 Rec'd Date: 5-1-03 Client: a) Subject to (FT Marion Brass Courier: ted Est Project: Airbill No. \$253 6077 9080 Quote: RA 1062 Login No. YI/AMOST COD TO CET Subcontract? TAT Verbal Cooler Rec'd By: **Parameters** Sample Login By: Temperature: Cyanide Samples checked for sulfide & chlorine? Phenol Samples checked for chlorine? Received in Good Condition? If no, explain: 00 CompuChem Client ID No & No. & P H Ō Date Military p No. & No. & No. & Matrix No. & No & н Type Type Н Type Type Type Турс Type ID 20,5 Time Type NA 04/29 JWOI PB 15 10 3,29 RX OI DPPB 15 10 1.2508 02 PB 16.45 03 17:00 PW OI 16:20 600 09TB 01 03 09:45 10:15 04 11:00 06 13 20 14 00 3.250PL 08 Dr 14:00 11250PL Ø Container Type Abbreviations: 40ml (40ml yial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER fil - 6:28:01 ace

COMMERCIAL RECEIVING LOG, Rec'd Date: 5-1-03 Client: Courier: 1 Lab Instructions Project: Airbill No. 8253 6077 4080 Quote: 171067 Login No. RX 1067, RX106 Subcontract? TAT Verbal Report / Cooler Rec'd By: **Parameters** Sample Login By: 2,6 76,0 ℃ Temperature: Cyanide Samples checked for sulfide & chlorine? Y / [NA] Phenol Samples checked for chlorine? Received in Good Condition? If no explain: svoe CompuChem No. & No & Client ID Na. & No. & Matrix Military No. & Date No. & No. & Type Type Туре Type Type Type 20 03 Time Type Type 14 ID: OIPB BX1067-15.10 9.40ml OLDPPB 2.Fil 5.40ml 02 PB 03 CATBPB OI PB 12zia-7-&9 FBPB 3:40 ml IOTS PB LIPL OIPB ZIAL ()2 03 LAL 2.AL 00 N 07 DS 3. ₽1 2996 80 ∞ Container Type Abbreviations: 40ml, (40ml, vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER

rff - 6/28/01 dee

CUMPUCHENI a DIVISUR OF DIDOLOG ARMAN

Internal Chain of Custody

RAW SAMPLE

Laboratory:

Wetchem

Matrix: H₀0

Request Date:

5/6/03

Comments:

_	OON	Di-4	Amatonia	I December	Datte Number
Ц	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
1	XX1067-1	5/1/03	AMMONIA (AS N)	Hosoy	3 of 3
2	RX1067-21	5/1/03	AMMONIA (AS N)		of
3	RX1067-3	5/1/03	AMMONIA (AS N)		of
4	RX1067-4/	5/1/03	AMMONIA (AS N)		of
5	RX1067-5	5/1/03	AMMONIA (AS N)	V	of
6					of `
7					of
8					of
9					of
10					of
11					of
12					of
13					of
14					of
15					of
16					of
17			<u> </u>		of
18					of
19	· · · · · · · · · · · · · · · · · · ·				of
20	·				of

Relinquished B. D. By:	Received By:	Date: 5/6/03	Time: 6:45
Relinquished By:	Received By: Cooley #1	Date: <u>5-6-03</u>	Time:
Relinquished	Received		
Ву:	Ву:	Date:	Time:

Internal Chain of Custody

RAW SAMPLE

Laboratory:

Wetchem

Matrix: H₂ 0

Request Date:

5/5/03

Comments:

	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
1	RX1067-1 V	5/1/03	CHLORIDE	NONE	2 of 3
2	RX1067-2	5/1/03	CHLORIDE		of
3	RX1067-3	5/1/03	CHLORIDE		of
4	RX1067-4 Y	5/1/03	CHLORIDE		of
5	RX1067-5	5/1/03	CHLORIDE	<u> </u>	of
6					of
7	· · · · · · · · · · · · · · · · · · ·				of
8					of
9					of
10					of
11					of
12					of
13					of
14			~		of
15			· 		of
16					of
17					of
18					of
19					of
20					of

Relinquished H	Received By:	Date: 5/5/03	Time: 8: 45
Relinquished By:	Received By: cooler #1	Date: 5/5/03	Time: 6.50
Relinquished	Received		
By:	By:	Date:	Time:

APPENDIX C Transportation Airbill

402

Express USA Airbill & 25360779080	Elini, i Sender's Copy
Please part and preshard 4.30.73 Sender's FedEx Account Number 2431-0147-6	4a Express Package Service Packages up to 150 fbs. Dehary commitment may be later in room area. FedEx Priority Overnight FedEx Standard Overnight FedEx First Overnight FedEx Standard Overnight FedEx First Overnight FedEx Control Overnight FedEx First Overnight FedEx First Overnight
" Phone (317) 718-3688	FedEx 2Day* Second business day FedEx Express Saver* Their business day * FedEx EnveloperLater Rate not evaluable Millimited charge time-pound rate
iny D & M INC	4b Express Freight Service Packages over 150 libs. Dativery conventment may be later in some areas.
s 1Q5 COMMERCE DR STE B	FedEx 1Day Freight FedEx 2Day Freight FedEx 3Day Freight Second business day *Call for Confirmation:
DANVILLE State IN ZIP 46122	5 Packaging Declared what first 2000 PedEx Envelope/Letter* FedEx Pak* Other Pkg. Sociated Sea, FedEx Soc.
Internal Billing Reference	6 Special Handling Inches Federa in Section 3
erts Sample Recewn Phone 800 18335097	SATURDAY Delivery RESTRICTIONS Available only for feel; Priority Overright and Feel; Priority Descript and Feel; Priority Fee
· Composem	One hox must be checked. Yes Shipper's Declaration The required Declaration The required Declaration The required The report control is whitemed in First pactication. Carpo Aircraft Only
5 50 Mad son Ave 14 Folice location, print Folice, address. We cannot deliver to P.D. boxes or P.D. 20° codes.	7 Paymont Bill to: Enter Fulls, Sect. No. or Credit Card No. bellow.
Out Pac Salar Face	Acct No. in Section Twill be label.
Cary State NC ZP 27513	Feder Acce, No. 1355 8422 - 3 Equ. Sede Control Processors Treat Weight Knot Declared Value?
Peel and Stick FedEx USA Airbill	10 557 2000
See back for application instructions.	TOur liability is firmed to \$100 unless you declare a higher value. See back for details.
Questions? Visit our Web site at www.fedex.com or call 1:600-Go-FedEx* (800)463-3339.	8 Release Signature Son to authorize delivery without obtaining signature.

0165043933

New Date 7/00=Part #155912G +-\$1994-2000 FedEx+PRINTED IN U.S.A. GBIFE 11/00

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ortation charges. See

Terms And Conditions

Definitions On this Airhill, "we," "our," and "us" refer You" and "your" refer to the cander its amindained and new to Federal Express Corporation, its employees, and agents.

Agreement To Te

agree to those terms of Service Guide and this No one is authorized to deliver, you agree to a current Service Guide, interest in the package

Responsibility Fo

Airbill You are resp goods and properly filling based on our best estir of packages and/or we received and/or an esti as determined by us Responsibility For responsible for all delive different payment instru in either returning your pending disposition.

And Liabilities No Limitations On Oc

charge for each additu declared value does no Our liability in connect lesser of your actual da higher value, pay an ac actual loss in a timely r Imbility insurance

including but not limited to took or income or profits. In any event, we will me had knowledge that sur declared value of a ship direct, incidental, spec

We won't be liable.

- for your acts or omissions including his nest the continued the

You may call our Customer Service นี้ยังอีกักที่ยังใช้สัง คื่องสัง 1-สถกะเละเละนะบัน เอกา เลา กาา "จ (epott a)clath) However, The second second second

, not deduct the amount of of your claim, you must s aboût it. We aren't ou have paid all Fed≣x. MASTER TRK#:

Mill assume the package of us to process your claim, 30APR

Pkg Trk#'s: 793201285312 793201285323

793201285334

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793201285390

age without noting any will assume the package certons and packing

ations Shipments to nress Saver may be our option, open and lient's signature.

or you give them to us

18:53

be likely to cause delay nent, or personnel; or if syrentServee Guide. ve the right to reject a I the shipment would Pcs: 10 Emp#: 83535

is required, please use E IS NOT AVAILABLE

• fed Afederal excise o tente Code on the eir if any, is paid by us request and with some se event of untimely STA Rt#:

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Recipient Copy

set out in the current Service Guide.

APPENDIX B Trillium, Inc. Data Validation Reports



DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

ORGANIC ANALYSIS DATA Volatiles in Water

SDG Nos. RX1067 and RZ1067 April 2003 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 23, 2003



EXECUTIVE SUMMARY

Validation of the volatile organics analysis data prepared by CompuChem Environmental for five water samples, one field blank, and two trip blanks from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in two separate data packages, under Sample Delivery Group (SDG) Nos. RX1067 and RZ1067, which were received for review on June 12, 2003, with additional information provided on June 30, 2003, and July 22, 2003. The following samples were reported:

SDG No. RZ1067:

GW08PB (MB-1)

GW08DPPB (MB-1D)

GW07PB (MB-2)

GW09FBPB (field blank)

GW10TBPB (trip blank)

SDG No. RX1067:

SW01PB (SW-1)

SW01DPPB (SW-1D)

SW04TBPB (trip blank)

Findings of the validation effort resulted in the following qualifications of reported sample results:

- Results for benzene, toluene, ethylbenzene, styrene, total xylenes, isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene in GW08DPPB were qualified as estimated (UJ).
- Results for all target analytes in GW10TBPB were qualified as estimated (UJ).
- Results for acetone and 2-butanone in GW09FBPB were qualified as estimated (J).
- Results for acetone in GW07PB, GW08PB, and GW08DPPB were qualified as estimated (UJ).
- Results for methylene chloride in GW08PB, GW08DPPB, GW07PB, GW10TBPB, GW09FBPB, SW01PB, and SW04TBPB were qualified as less than the CRQL (10 U).
- The result for trichloroethene in GW08PB was qualified as estimated (J).
- The TIC peak reported at RT 15.38 minutes in GW10TBPB was rejected (R).

All "B" qualifiers, applied by the laboratory to indicate the presence of the analyte in the associated method blank, were removed by the validator. Laboratory-applied "J" qualifiers were not removed by the validator except where superceded by validator-applied qualifiers, as noted above.



Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues observed in the data packages are discussed in Section XIII.

This validation report should be considered <u>part of both data packages</u> for all future distributions of the volatiles data.



INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis (OLM04.2). Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in accordance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev. 11), "Evaluation of Organics Data for the CLP," (6/96) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J- The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
- NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.



R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

These codes are recorded on the customized data tables in Attachment A and the laboratory's Organic Analysis Data Sheets (Form I, Attachment B) to qualify the results as appropriate according to the review of the data packages.

Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The water samples and associated blanks were collected on 4/29-30/03. All sample analyses were performed on 5/8-9/03, which is within the specified 14-day holding time for chemically-preserved water samples. With the exceptions noted below, acceptable pH values of 1 were determined by the laboratory at the time of analysis for each sample, confirming successful chemical preservation. Sample pHs were not documented directly on the chain of custody (COC) records, but were recorded on Water Batch Sheets provided in both data packages.

Elevated pH values were documented for GW08DPPB (pH=4), GW08MSPB (pH=6), and GW08MSDPB (pH=6). Results for all aromatic target analytes (benzene, toluene, ethylbenzene, styrene, total xylenes, isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene) in GW08DPPB were qualified as estimated (UJ) because this sample was not properly acidified and was analyzed beyond the required holding time for non-chemically preserved water samples (seven days from collection). Since the pH for the GW08PB was acceptable, no action was taken with regard to the elevated pHs in the aliquots of this sample that were designated for matrix spike analyses.

Acceptable cooler temperatures (2-6°C) on receipt at the laboratory were recorded on both COC records applicable to these samples. The same temperatures were also recorded on the laboratory's receiving logs in both data packages.

Sampler notations on each COC indicate that the samples for volatiles analysis were preserved with hydrochloric acid and iced. Laboratory notations on the COCs state that two of the three vials for SW04TBPB and all 3 vials for GW10TBPB contained pea-sized air bubbles. For the purposes of this validation effort, it was assumed that the laboratory utilized the third, unaffected vial for analysis of SW04TBPB; this assumption was confirmed by the laboratory via email on 6/30/03. Since all three vials for GW10TBPB were affected by substantial air bubbles, results for all target analytes in this sample were qualified as estimated (UJ).

The narratives in both data packages state that all samples were received intact and properly refrigerated. No mention is made of the air bubbles or the elevated pH values.

II. GC/MS Instrument Performance Checks

Three instrument performance checks using bromofluorobenzene (BFB) were run and reported, representing every shift (12-hour period) during which samples or associated standards and quality control samples were analyzed. Results for all three performance checks were acceptable.



III. Calibration

Sample analyses were performed on a single gas chromatograph/mass spectrometer (GC/MS) system identified as HP59. Several target analytes were manually integrated in one or more of the calibration standards run on this instrument in association with this data set. Each manual integration was correctly performed, properly documented and accurately incorporated into the applicable quantitation report. No system monitoring or internal standard peaks were manually integrated.

A. Initial Calibration (IC)

One ambient purge IC (5/1/03) was associated with the reported sample and quality control analyses. Documentation of all individual IC standards run was present in both data packages and relative response factor (RRF) as well as percent relative standard deviation (%RSD) values were correctly calculated and accurately reported. All RRF values were above the minimum acceptance criterion (0.05). %RSD values were below the 30% maximum acceptance criterion except for bromomethane (38.5%).

The elevated %RSD for bromomethane can be traced to an exceptionally low response in the 200 ppb IC standard, very good consistency is observed among the other four IC standards. Using the 10-100 ppb standards only, an average RRF of 1.234 and an acceptable %RSD value of 8.1% are obtained. Bromomethane was not detected in any of the samples in this data set and the reporting limit is not compromised; therefore, no sample results were qualified based on the reported IC results for this analyte.

B. Continuing Calibration (CC)

Reported site sample and quality control analyses were performed under two CC standards, (5/8/03-10:53 and 5/8/03-19:55). Documentation of both CC standards was present in both data packages and RRF as well as percent difference (%D) values were correctly calculated and accurately reported. All RRFs were above the 0.05 minimum criterion. Reported %D values were less than the maximum acceptance limit of 25% except for bromomethane (40.7%) and acetone (30.0%) in the 5/8/03-10:53 CC, and acetone (52.1%), 2-butanone (29.9%), and 1,2,4-trichlorobenzene (27.7%) in the 5/8/03-19:55 CC.

Compared to the shortened IC curve (10-100 ppb, as discussed in the previous section), acceptable %D values for bromomethane (10.4% and 5.0%) were obtained in both CC standards. Therefore, no action was warranted with respect to this analyte.

The results for acetone and 2-butanone in GW09FBPB were qualified as estimated (J) because they were detected in this sample, which was associated with a CC standard which had elevated %Ds for these compounds. Results for acetone in GW07PB, GW08PB, and GW08DPPB were qualified as estimated (UJ) because, although it was not detected, the %D value for this analyte in the



associated CC standard was substantially above the maximum acceptance limit (i.e., was greater than 50%).

No other positive results were reported for the target analytes listed above in the samples associated with the affected CCs, the RRFs were all acceptable (i.e., were greater than 0.05) in the affected CC standards, and the %Ds were not substantially above the acceptance criterion (i.e., were not greater than 50%). Therefore, no additional qualifiers were applied based on the CC standard results.

IV. Blanks

Two laboratory method blanks (MBs: VBLKNU and VBLKNV) were analyzed with the samples in this data set. Methylene chloride (1 μ g/L) and 1,2,4-trichlorobenzene (2 μ g/L) were detected in VBLKNU and 1,2,4-trichlorobenzene (2 μ g/L) was detected in VBLKNV. Results for methylene chloride in GW10TBPB, SW01PB, and SW04TBPB were qualified as less than the contract required quantitation limit (CRQL, 10 U) because the reported values were less than five times the concentration found in the associated method blank. The "B" qualifiers applied by the laboratory to these results to indicate that these compounds were also present in the associated method blank were removed by the validator.

1,2,4-Trichlorobenzene was not detected in any of the site samples. Therefore, no additional qualifiers were required based on method blank contamination.

One storage blank (VHBLKLS) was also analyzed in association with the site samples. Methylene chloride (1 μ g/L) was detected in VHBLKLS. Results for methylene chloride in all samples where it was detected (GW08PB, GW08DPPB, GW07PB, GW10TBPB, GW09FBPB, SW01PB, and SW04TBPB) were qualified as less than the CRQL (10 U) on this basis.

Two trip blanks (GW10TBPB and SW04TBPB) and one field blank (GW09FBPB) were included in this data set. After qualifications based on laboratory blank contamination, acetone (23 μ g/L) and 2-butanone (11 μ g/L) were found in GW09FBPB. Neither of these target analytes was detected in any of the site samples. Therefore, no sample results required qualification on this basis.

No tentatively identified compounds (TICs) were found in any of the laboratory blanks associated with this data set. TICs reported in GW09FBPB are discussed in Section IX.

V. System Monitoring Compound Recoveries

Recoveries of the three system monitoring compounds in the reported results for all samples and blanks were correctly calculated, accurately reported and within the acceptance limits as documented on the summary forms.



VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Samples GW08PB and SW01PB were prepared and analyzed as MS/MSD pairs. Percent recoveries (%R) and relative percent differences (RPDs) between paired recoveries were correctly calculated and accurately reported for both sets of quality control data. The %Rs for all spiked target compounds were acceptable (100-114%) and reproducible (RPDs \leq 2) in SW01PBMS/MSD. For GW08PBMS/MSD, recoveries for 1,1-dichloroethene, benzene, toluene, and chlorobenzene were acceptable (100-118%) and reproducible (RPDs \leq 2), but recoveries for trichloroethene (140% and 120%; QC 71-120%) unacceptably high or right at the upper limit. The RPD for trichloroethene was also slightly high (15%; QC \leq 14%).

In the unspiked analysis of GW08PB, trichloroethene was found at a concentration very close to the spike amount added (60 μ g/L in unspiked sample; 50 μ g/L added). Accurate recovery should be achievable under these circumstances. Therefore, the result for trichloroethene in GW08PB was qualified as estimated (J) on this basis.

A comparison of results for non-blank-related, unspiked target analytes in GW08PB, the MS, and the MSD was made. Agreement among the three results for cis-1,2-dichloroethene (7.5 %RSD) was very good.

A comparison of results for non-blank-related, unspiked target analytes in SW01PB, the MS, and the MSD was also made. Acetone was found at low concentrations in the MS (3 μ g/L) and in the MSD (4 μ g/L) but was not found in SW01PB. Since the positive results were both less than the CRQL and this analyte was not reported by the laboratory in the unspiked sample, no action was taken based on these inconsistencies.

VII. Field Duplicate

Sample GW08DPPB was identified as a field duplicate of GW08PB. Agreement between paired results for cis-1,2-dichloroethene (0 RPD), and trichloroethene (16.8 RPD) was acceptable.

Sample SW01DPPB was identified as a field duplicate of SW01PB. After qualifications based on blank contamination, no target analytes were reported in either sample. Therefore, no quantitative evaluation of precision could be made using these data.

VIII. Internal Standard (IS) Performance

All IS areas and retention times were within documented quality control limits for the reported sample analyses.



IX. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the applicable data packages.

X. Compound Quantitation and Reported Detection Limits

Target compound concentrations and CRQLs were correctly calculated and accurately reported. No dilutions were required for any of the samples.

"J" qualifiers were appropriately applied by the laboratory to the sample Form Is when the concentration of an analyte was less than the sample-specific quantitation limit. Except where superseded by another qualifier (e.g., "U" at the CRQL), these "J" qualifiers were not removed by the validator.

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific quantitation limits may be found on the laboratory-generated Form I for each sample (Attachment B) as well as on the data tables.

XL Tentatively Identified Compounds (TIC)

Library searches were performed as required for the samples in this data set.

A laboratory artifact at retention time (RT) 15.38 minutes was reported in GW10TBPB. A slightly smaller peak at this RT was observed in the chromatogram for each of the two MBs associated with this data set. Further, based on the library search and the mass spectrum, the artifact appears to be a siloxane compound, which is typically associated with column bleed. Therefore, based on professional judgment, the TIC at 15.38 minutes in GW10TBPB was rejected (R) by the validator.

Two TICs were also reported in GW09FBPB. Neither of these peaks was observed in any of the associated site samples. Therefore, no action was taken by the validator on this basis.

No other TICs were reported in any of the remaining samples in this data set.

XII. System Performance

The GC/MS system appears to have been working satisfactorily at the time of these analyses, based on review of the available raw data.



XIII. Documentation

Three chain of custody (COC) records applicable to these samples were provided for review. The following issues were noted:

- Analysis of VOCs was not specified on the COC for GW07PB.
- Despite a specific request on the COCs, sample pHs on laboratory receipt were not recorded on the COCs.
- Copies of the courier airbills were not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on each COC record.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

Sample GW10TBPB (RZ1067-11) was incorrectly identified by the laboratory throughout the data package. On the water batch sheet and in the analysis run logs, it was identified as "GW01TBPB." On all of the summary forms (including Form I) and in the narrative, it was identified as "GW03PB." Where it was identified as GW03PB, the laboratory sample number for GW03PB (RZ1067-7) was also found; on the run log and batch sheet, where it was identified as GW01TBPB, laboratory sample number RZ1067-11 was also recorded. At the validator's request, the laboratory investigated this situation, and determined that the correct sample was actually analyzed. The sample identifications were apparently mixed-up during report preparation. Throughout this report, the sample in question has been correctly identified as GW10TBPB. Corrected data package pages (including page numbers, as indicated below) were provided by the laboratory via FedEx on 7/21/03 as follows:

Narrative - no page numbers (corrected to pp 3-4) and pp 48-49

Form I - pp 14-16 (corrected to pp 11-13) and pp 93-95 (corrected to pp 84-86)

Form II - p 31 and p 70

Form IV - p 35 and p 74

Form V - p 78

Form VIII - p 44 and p 81

Raw Sample Data - pp 96-101 (corrected to pp 87-92)



Laboratory-specified page numbers were corrected by the validator as noted above in italics. In each case (with the exception of the narrative), the page numbers indicated by the laboratory would have replaced the pages applicable to GW07PB, which was correctly reported, rather than GW03PB. All of the corrected pages were inserted into the data package for RZ1067 by the validator, replacing the originally-provided pages.

The laboratory-corrected narrative was further corrected by the validator to reflect GW10TBPB (rather than GW03PB) in the third paragraph. In addition, "GW09FPPB" was corrected to "GW09FBPB" in the second and third sentences of the third paragraph.

These documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIV. Overall Assessment

Results for volatile compounds in the samples reported in SDG Nos. RX1067 and RZ1067 were qualified as follows based on the validation effort:

- Results for benzene, toluene, ethylbenzene, styrene, total xylenes, isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene in GW08DPPB were qualified as estimated (UJ) because this sample was not properly acidified and was analyzed beyond the required holding time for non-chemically preserved water samples.
- Results for all target analytes in GW10TBPB were qualified as estimated (UJ) because all three sample vials contained substantial air bubbles on receipt at the laboratory.
- Results for acetone and 2-butanone in GW09FBPB were qualified as estimated (J) based on unacceptable %D values in the associated CC standard.
- Results for acetone in GW07PB, GW08PB, and GW08DPPB were qualified as estimated (UJ) based on an unacceptable %D value in the associated CC standard.
- Results for methylene chloride in all samples where it was detected (GW08PB, GW08DPPB, GW07PB, GW10TBPB, GW09FBPB, SW01PB, and SW04TBPB) were qualified as less than the CRQL (10 U) based on contamination in the association method and/or storage blanks.



- The result for trichloroethene in GW08PB was qualified as estimated (J) due to unacceptably high recoveries in the matrix spike analyses.
- The TIC peak reported at RT 15.38 minutes in GW10TBPB was rejected (R) based on its identification as a laboratory artifact and professional judgment.

All "B" qualifiers, applied by the laboratory to indicate the presence of the analyte in the associated method blank, were removed by the validator. Laboratory-applied "J" qualifiers were not removed by the validator except where superceded by validator-applied qualifiers, as noted above.

Documentation issues observed in the data packages are discussed in Section XIII.

This validation report should be considered <u>part of both data packages</u> for all future distributions of the volatiles data.



ATTACHMENT A

DATA TABLES SDG Nos. RX1067 and RZ1067 Volatiles in Water - Marion Bragg, April 2003

Marion Bragg Landfill - April 2003 - Volatiles in Ground and Surface Waters

Results are in ug/L

Results are in ug/L		175	148-48	116.4	F: 14 B1 1
Collection Point ==========	>	MB-1	MB-1D	MB-2	Field Blank
Sample ID ==========>	_	GW08PB	GW08DPPB	GW07PB	GW09FBPB
Lab Sample No. =========		RZ1067-3	RZ1067-4	RZ1067-2	RZ1067-1
Collection Date. =============		4/30/03	4/30/03	4/30/03	4/30/03
	CRQL				
Dichlorodifluoromethane	10	10 U	10 U	10 U	10 U
Chloromethane	10	10 U	10 U	10 U	10 U
Vinyl Chloride	10	10 U	10 U	2 J	10 U
Bromomethane	10	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U	10 U
Acetone	10	10 UJ	10 UJ	10 UJ	23 J
Carbon Disulfide	10	10 U	10 U	1 J	10 U
Methyl acetate	10	10 U	10 U	10 U	10 U
Methylene chloride	10	10 U	10 U	10 U	10 U
trans-1,2-dichloroethene	10	10 U	10 U	10 U	·10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 U	10 U
cis-1,2-dichloroethene	10	7 J	7 J	10 U	10 U
2-Butanone	10	10 U	10 U	10 U	11 J
Chloroform	10	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U	10 U
Benzene	10	10 U	10 UJ	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U	10 U
Trichloroethene	10	60 J	71	10 U	10 U
Methylcyclohexane	10	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U	10 U	10 U
Toluene	10	10 U	10 UJ	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U	10 U
Chlorobenzene	10	10 U	10 UJ	0.8 J	10 U
Ethylbenzene	10	10 U	10 UJ	10 U	10 U
Total Xylenes	10	10 U	10 UJ	10 U	10 U
Styrene	10	10 U	10 UJ	10 U	10 U
Bromoform	10	10 U	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 UJ	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 UJ	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 UJ	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 UJ	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 U	10 UJ	10 U	10 U

Marion Bragg Landfill - April 2003 - Volatiles in Ground and Surface Waters

Results are in ug/L

Collection Point ========>	===	Trip Blank	SW-1	SW-1D	Tac Dic-L
Sample ID ========>		GW10TBPB	SW01PB	SW01DPPB	Trip Blank SW04TBPB
Lab Sample No. ============		RZ1067-11	RX1067-1	RX1067-2	RX1067-6
Collection Date. ==============		4/30/03	4/29/03	4/29/03	4/29/03
CONSCION Date. =2===================================	CRQL	4/30/03	4/43/03	4123103	4/28/03
Dishlar difference of the second		46 11:	46 11	40.41	45 11
Dichlorodifluoromethane	10	10 UJ	10 U	10 U	10 U
Chloromethane	10	10 UJ	10 U	10 U	10 U
Vinyl Chloride	10	10 UJ	10 U	10 U	10 U
Bromomethane	10	10 UJ	10 U	10 U 10 U	10 U
Chloroethane	10	10 UJ	10 U		10 U
Trichlorofluoromethane	10	10 UJ	10 U	10 U	10 U
1,1-Dichloroethene	10	10 UJ	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 UJ	10 U 10 U	10 U	10 U 10 U
Acetone	10	10 UJ		10 U	_
Carbon Disulfide	10	10 UJ 10 UJ	10 U 10 U	10 U 10 U	10 U 10 U
Methyl acetate	10 10	10 UJ	10 U	10 U	10 U
Methylene chloride trans-1,2-dichloroethene	10	10 UJ	10 U	10 U	· 10 U
· ·	10	10 UJ	10 U	10 U	10 U
Methyl tert-butyl ether 1,1-Dichloroethane	10	10 UJ	10 U	10 U	10 U
cis-1,2-dichloroethene	10	10 UJ	10 U	10 U	10 U
2-Butanone	10	10 UJ	10 U	10 U	10 U
Chloroform	10	10 UJ	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 UJ	10 U	10 U	10 U
Cyclohexane	10	10 UJ	10 U	10 U	10 U
Carbon Tetrachloride	10	10 UJ	10 U	10 U	10 U
Benzene	10	10 UJ	10 U	10 U	10 U
1,2-Dichloroethane	10	10 UJ	10 U	10 U	10 U
Trichloroethene	10	10 UJ	10 U	10 U	10 U
Methylcyclohexane	10	10 UJ	10 U	10 U	10 U
1,2-Dichloropropane	10	10 UJ	10 U	10 U	10 U
Bromodichloromethane	10	10 UJ	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 UJ	10 U	10 U	10 U
4-Methyl-2-pentanone	10	10 UJ	10 U	10 U	10 U
Toluene	10	10 UJ	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 UJ	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 UJ	10 U	10 U	10 U
Tetrachloroethene	10	10 UJ	10 U	10 U	10 U
2-Hexanone	10	10 UJ	10 U	10 U	10 U
Dibromochloromethane	10	10 UJ	10 U	10 U	10 U
1,2-Dibromoethane	10	10 UJ	10 U	10 U	10 U
Chlorobenzene	10	10 UJ	10 U	10 U	10 U
Ethylbenzene	10	10 UJ	10 U	10 U	10 U
Total Xylenes	10	10 UJ	10 U	10 U	10 U
Styrene	10	10 UJ	10 U	10 U	10 U
Bromoform	10	10 UJ	10 U	10 U	10 U
Isopropylbenzene	10	10 UJ	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 UJ	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 UJ	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 UJ	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 UJ	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 UJ	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 UJ	10 U	10 U	10 U



ATTACHMENT B

ORGANIC ANALYSIS DATA SHEETS (Form I)
SDG Nos. RX1067 and RZ1067
Volatiles in Water - Marion Bragg, April 2003

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

GW08PB MB-1

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-3

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RZ1067-3RB59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: __ (uL)

CAS NO. COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

75-71-8	Dichlorodifluoromethane	10	Ŭ
74-87-3	Chloromethane	10	Ū
75-01-4	Vinyl Chloride	10	ט
74-83-9	Bromomethane	10	Ŭ
75-00-3	Chloroethane	10	ΰ
75-69-4	Trichlorofluoromethane	10	Ū
75-35-4	1,1-Dichloroethene	10	Ū
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	BUJ
75-15-0	Carbon Disulfide	10	77
79-20-9	Methyl Acetate	10	<u>U</u> .
75-09-2	Methylene Chloride	10 %	7 U
156-60-5	trans-1,2-Dichloroethene	10	To the second
1634-04-4	Methyl tert-Butyl Ether	. 10	Ū (
75-34-3	1,1-Dichloroethane	10	Ū
156-59-2	cis-1,2-Dichloroethene	7	J
78-93-3	2-Butanone	10	Ū
67-66-3	Chloroform	10	Ū
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	Ū
71-43-2	Benzene	10	Ü
107-06-2	1,2-Dichloroethane	10	ט

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

GW08PB

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-3

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RZ1067-3RB59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec. _____

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

79-01-6	Trichloroethene	60	7
108-87-2	Methylcyclohexane	10	U cae
78-87-5	1,2-Dichloropropane	10	U 2/20
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	Ū
108-88-3	Toluene	10	Ū
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	Ū
124-48-1	Dibromochloromethane	10	Ū
106-93-4	1,2-Dibromoethane	10	Ü
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	Ü
1330-20-7	Xylene (Total)	_ 10	U
100-42-5	Styrene	10	Ū
75-25-2	Bromoform	10	Ü
98-82-8	Isopropylbenzene	10	Ü
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	Ü
106-46-7	1,4-Dichlorobenzene	10	Ū
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	Ü
120-82-1	1,2,4-Trichlorobenzene	10	U

1F VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

				GW08PB
Lab Name: COMPUCHEM		Contract:	OLM04-REVS	MB-1
Lab Code: LIBRTY Ca	se No.:	SAS No.:		SDG No.: RZ1067
Matrix: (soil/water)	WATER		Lab Sample ID:	RZ1067-3
Sample wt/vol: 5	(g/mL) ML		Lab File ID: R	Z 1067-3RB59
Level: (low/med)	LOM		Date Received:	05/01/03
Moisture: not dec.			Date Analyzed:	05/08/03
GC Column: ZB624	ID: 0.32 (mm)		Dilution Factor	: 1.0

CONCENTRATION UNITS:

Soil Aliquot Volume: ____(uL)

Number TICs found: 0 (ug/L or ug/Kg) UG/L

Soil Extract Volume: (uL)

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CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

GW08DPPR IMB-ID

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-4

Sample wt/vol:

5

(g/mL) ML

Lab File ID: RZ1067-4RB59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

CAS NO. COMPOUND

75-71-8	Dichlorodifluoromethane	10	U	1
74-87-3	Chloromethane	10	Ü	1
75-01-4	Vinyl Chloride	10	Ū	1
74-83-9	Bromomethane	10	U	1
75-00-3	Chloroethane	10	Ū	1
75-69-4	Trichlorofluoromethane	10	Ü	1
75-35-4	1,1-Dichloroethene	10	U	1
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U	W
67-64-1	Acetone	10	BUJ	10
75-15-0	Carbon Disulfide	10	U	1
79-20-9	Methyl Acetate	10	U	1
75-09-2	Methylene Chloride	10 2	8 U	100
156-60-5	trans-1,2-Dichloroethene	10	U	
1634-04-4	Methyl tert-Butyl Ether	10	Ū	
75-34-3	1,1-Dichloroethane	10	Ū	1(
156-59-2	cis-1,2-Dichloroethene	7	J_	1
78-93-3	2-Butanone	10	Ū	1
67-66-3	Chloroform	10	Ū	12
		1 7 7		
71-55-6	1,1,1-Trichloroethane	10	U	10
110-82-7	Cyclohexane	10	Ū	75
110-82-7 56-23-5	Cyclohexane Carbon Tetrachloride		U U,	£X.
110-82-7	Cyclohexane	10	Ū	carrixs

FORM I VOA-1

EPA SAMPLE NO.

GW08DPPB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-4

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RZ1067-4RB59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ___ (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

CAS NO. COMPOUND

				
79-01-6	Trichloroethene	71		1
108-87-2	Methylcyclohexane	10	U	.
78-87-5	1,2-Dichloropropane	10	U	1
75-27-4	Bromodichloromethane	10	U	1
10061-01-5	cis-1,3-Dichloropropene	10	Ü	1
108-10-1	4-Methyl-2-Pentanone	10	U,	
108-88-3	Toluene	10	LYUJ	3
10061-02-6	trans-1,3-Dichloropropene	10	U	10.
79-00-5	1,1,2-Trichloroethane	10	Ū	3
127-18-4	Tetrachloroethene	10	U	13
591-78-6	2-Hexanone	10	Ū	4
124-48-1	Dibromochloromethane	10	Ü	11
106-93-4	1,2-Dibromoethane	10	Ū	\mathbf{I}
108-90-7	Chlorobenzene	10	JY UJ	11
100-41-4	Ethylbenzene	10	1 UJ	\cup
1330-20-7	Xylene (Total)	10	y uj	$\perp I$
100-42-5	Styrene	10	ZUJ	11
75-25-2	Bromoform	10	Ū,	11
98-82-8	Isopropylbenzene	10	N UJ	1.
79-34-5	1,1,2,2-Tetrachloroethane	10	U	7
541-73-1	1,3-Dichlorobenzene	10	W UJ	6
106-46-7	1,4-Dichlorobenzene	10	1 UJ	130
95-50-1	1,2-Dichlorobenzene	10	BUJ	1.5
96-12-8	1,2-Dibromo-3-Chloropropane	10	U	alu
120-82-1	1,2,4-Trichlorobenzene	10	BUJ	12

FORM I VOA-2

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MB-	GW0	8DE	PB
MB-	10	•	

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

LOW

Lab Sample ID: RZ1067-4

Lab File ID: RZ1067-4RB59

Sample wt/vol: 5 Level: (low/med)

(g/mL) ML

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____ (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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30.	<u></u>			

FORM I VOA-TIC

EPA SAMPLE NO.

GW07PB MB-2

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-2

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RZ1067-2RA59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

	10	Ü
	10	U
	2	J
	10	U
	10	Ü
Trichlorofluoromethane	10	Ū
1,1-Dichloroethene	10	Ü
1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
Acetone	10	VUJ:
Carbon Disulfide	1	J
Methyl Acetate	10	U
	10 2	JU.
	10	U
	10	Ü
1,1-Dichloroethane	10	Ū
cis-1,2-Dichloroethene	10	Ü
2-Butanone	10	Ū
Chloroform	10	Ū
1,1,1-Trichloroethane	10	U
Cyclohexane	10	Ū
Carbon Tetrachloride	10	Ū
Benzene	10	Ū
1,2-Dichloroethane	10	U
	1,1,2-Trichloro-1,2,2-trifluoroethane Acetone Carbon Disulfide Methyl Acetate Methylene Chloride trans-1,2-Dichloroethene Methyl tert-Butyl Ether 1,1-Dichloroethane cis-1,2-Dichloroethene 2-Butanone Chloroform 1,1,1-Trichloroethane Cyclohexane Carbon Tetrachloride	Chloromethane 10 Vinyl Chloride 2 Bromomethane 10 Chloroethane 10 Trichlorofluoromethane 10 1,1-Dichloroethene 10 1,1,2-Trichloro-1,2,2-trifluoroethane 10 Acetone 10 Carbon Disulfide 1 Methyl Acetate 10 Methylene Chloride 10 trans-1,2-Dichloroethene 10 Methyl tert-Butyl Ether 10 1,1-Dichloroethane 10 cis-1,2-Dichloroethene 10 2-Butanone 10 Chloroform 10 1,1-Trichloroethane 10 Cyclohexane 10 Carbon Tetrachloride 10 Benzene 10

EPA SAMPLE NO.

Lab Name: COMPUCHEM Contract: OLM04-REVS GW07PB

MB-2

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-2

Sample wt/vol:

Lab File ID: RZ1067-2RA59

Level: (low/med) LOW

5

(g/mL) ML .

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

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	10	Ū
	10	Ü
	10	Ū
	10	Ū
	10	Ü
trans-1,3-Dichloropropene	10	Ū
1,1,2-Trichloroethane	10	Ū
Tetrachloroethene	10	Ū
2-Hexanone	1.0	U
	10	Ū
	10	Ū
Chlorobenzene	0.8	J
Ethylbenzene	10	Ū
Xylene (Total)	10	Ū
Styrene	10	Ū
Bromoform	10	Ū
Isopropylbenzene	10	Ū
1,1,2,2-Tetrachloroethane	10	Ū
	10	บ
1,4-Dichlorobenzene	10	Ū
1,2-Dichlorobenzene	10	Ü
1,2-Dibromo-3-Chloropropane	10	Ū
1,2,4-Trichlorobenzene	10	Ū
	2-Hexanone Dibromochloromethane 1,2-Dibromoethane Chlorobenzene Ethylbenzene Xylene (Total) Styrene Bromoform Isopropylbenzene 1,1,2,2-Tetrachloroethane 1,3-Dichlorobenzene	Methylcyclohexane 10 1,2-Dichloropropane 10 Bromodichloromethane 10 cis-1,3-Dichloropropene 10 4-Methyl-2-Pentanone 10 Toluene 10 trans-1,3-Dichloropropene 10 1,1,2-Trichloroethane 10 Tetrachloroethane 10 2-Hexanone 10 Dibromochloromethane 10 1,2-Dibromoethane 10 Chlorobenzene 0.8 Ethylbenzene 10 Xylene (Total) 10 Styrene 10 Bromoform 10 1,1,2,2-Tetrachloroethane 10 1,3-Dichlorobenzene 10 1,4-Dichlorobenzene 10 1,2-Dichlorobenzene 10 1,2-Dichlorobenzene 10 1,2-Dibromo-3-Chloropropane 10

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW07PB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-2

Sample wt/vol: 5

(g/mL) ML Lab File ID: RZ1067-2RA59

Level: (low/med)

LOW

Soil Extract Volume: ____(uL)

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm) Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 0

(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

GW09FBPB

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-1

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RZ1067-1RB59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CAS NO. COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

Dichlorodifluoromethane	10	Ū
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		Un
	10	U
	10 7	JU B
trans-1,2-Dichloroethene		υ 8
		U
	10	U 3
	10	U W
	11	1, 5
Chloroform	10	U
1,1,1-Trichloroethane	10	Ū
Cyclohexane	10	Ū
Carbon Tetrachloride	10	Ū
Benzene	10	Ū
1,2-Dichloroethane	10	Ū
	Cyclohexane Carbon Tetrachloride Benzene	Chloromethane 10 Vinyl Chloride 10 Bromomethane 10 Chloroethane 10 Trichlorofluoromethane 10 1,1-Dichloroethene 10 1,1,2-Trichloro-1,2,2-trifluoroethane 10 Acetone 23 Carbon Disulfide 10 Methyl Acetate 10 Methylene Chloride 10 trans-1,2-Dichloroethene 10 Methyl tert-Butyl Ether 10 1,1-Dichloroethane 10 cis-1,2-Dichloroethene 10 2-Butanone 11 Chloroform 10 1,1,1-Trichloroethane 10 Cyclohexane 10 Carbon Tetrachloride 10 Benzene 10

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

GW09FBPB

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-1

Sample wt/vol:

Lab File ID: RZ1067-1RB59

Date Received: 05/01/03

Level: (low/med) LOW

Date Analyzed: 05/08/03

% Moisture: not dec. _____

ID: 0.32 (mm)

5 (g/mL) ML

Dilution Factor: 1.0

Soil Extract Volume: (uL)

GC Column: ZB624

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

79-01-6	Trichloroethene	10 U
108-87-2	Methylcyclohexane	10 0
78-87-5	1,2-Dichloropropane	10 0
75-27-4	Bromodichloromethane	10 U
10061-01-5	cis-1,3-Dichloropropene	10 U
108-10-1	4-Methyl-2-Pentanone	10 U
108-88-3	Toluene	10 U
10061-02-6	trans-1,3-Dichloropropene	10 U
79-00-5	1,1,2-Trichloroethane	· 10 U
127-18-4	Tetrachloroethene	10 U
591-78-6	2-Hexanone	10 U
124-48-1	Dibromochloromethane	10 U
106-93-4	1,2-Dibromoethane	10 U
108-90-7	Chlorobenzene	10 U
100-41-4	Ethylbenzene	10 U
1330-20-7	Xylene (Total)	10 0
100-42-5	Styrene	10 U
75-25-2	Bromoform	10 U
98-82-8	Isopropylbenzene	10 U
79-34-5	1,1,2,2-Tetrachloroethane	10 U
541-73-1	1,3-Dichlorobenzene	10 U
106-46-7	1,4-Dichlorobenzene	10 U
95-50-1	1,2-Dichlorobenzene	10 U
96-12-8	1,2-Dibromo-3-Chloropropane	10 U
120-82-1	1,2,4-Trichlorobenzene	10 U

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

FB GW09FBPB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-1

Sample wt/vol: 5

(g/mL) ML

Lab File ID: RZ1067-1RB59

Level: (low/med)

LOW

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

Number TICs found: 2

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Ω
1. 75-45-6	METHANE, CHLORODIFLUORO- UNKNOWN	3.22	10	NJ
2.	UNKNOWN	5.59	25	J
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EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-11

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RZ1067-11A59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec. _____

Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CAS NO. COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	Ū
75-01-4	Vinyl Chloride	10	Ū
74-83-9	Bromomethane	10	Ü
75-00-3	Chloroethane	10	Ü
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	Ü
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	Ü
67-64-1	Acetone	10	Ü
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	Ū
75-09-2	Methylene Chloride	10 2	Boll
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U COE
75-34-3	1,1-Dichloroethane	10	U 77303
156-59-2	cis-1,2-Dichloroethene	10	Ü
78-93-3	2-Butanone	10	Ŭ
67-66-3	Chloroform	10	Ū
71-55-6	1,1,1-Trichloroethane	10	Ū
110-82-7	Cyclohexane	10	Ü
56-23-5	Carbon Tetrachloride	10	Ü
71-43-2	Benzene	10	Ü
107-06-2	1,2-Dichloroethane	10	U

FORM I VOA-1

EPA SAMPLE NO.

GW10TBPB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-11

Sample wt/vol:

5

Lab File ID: RZ1067-11A59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec. _____

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

(g/mL) ML

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

1	Mary and the same		
79-01-6	Trichloroethene	10	<u>U</u>
108-87-2	Methylcyclohexane	10	Ü
78-87-5	1,2-Dichloropropane	10	Ū
75-27-4	Bromodichloromethane	10	Ū
10061-01-5	cis-1,3-Dichloropropene	10	Ŭ
108-10-1	4-Methyl-2-Pentanone	10	Ū
108-88-3	Toluene	10	Ū
10061-02-6	trans-1,3-Dichloropropene	10	Ū
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	Ū
591-78-6	2-Hexanone	10	Ū
124-48-1	Dibromochloromethane	10	Ū
106-93-4	1,2-Dibromoethane	10	Ū
108-90-7	Chlorobenzene	10	Ū
100-41-4	Ethylbenzene	10	Ū
1330-20-7	Xylene (Total)	10	Ū
100-42-5	Styrene	10	Ū
75-25-2	Bromoform	10	Ū
98-82-8	Isopropylbenzene	10	Ū
79-34-5	1,1,2,2-Tetrachloroethane	10	Ū
541-73-1	1,3-Dichlorobenzene	10	Ū
106-46-7	1,4-Dichlorobenzene	10	Ū
95-50-1	1,2-Dichlorobenzene	10	Ū
96-12-8	1,2-Dibromo-3-Chloropropane	10	Ū
120-82-1	1,2,4-Trichlorobenzene	10	Ū

FORM I VOA-2

1F VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

-	
GW10TBPB	
TR	
1.10	

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Code: LIBRTY Case No.:

Lab Sample ID: RZ1067-11

Sample wt/vol: 5

(g/mL) ML

Lab File ID: RZ1067-11A59

Level: (low/med)

LOW

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____ (uL)

Soil Aliquot Volume: __(uL)

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

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CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

SW01PB	
5W-1	

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-1

Sample wt/vol:

5 (g/mL) ML

Lab File ID: RX1067-1A59

Level: (low/med)

LOW

Date Received: 05/01/03

% Moisture: not dec. _____

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

75-71-8	Dichlorodifluoromethane	10	U	1.
74-87-3	Chloromethane	10	U	l
75-01-4	Vinyl Chloride	10	Ū	
74-83-9	Bromomethane	10	U	
75-00-3	Chloroethane	10	Ū	
75-69-4	Trichlorofluoromethane	10	Ū	
75-35-4	1,1-Dichloroethene	10	U	ĺ
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	Ü	1
67-64-1	Acetone	10	U	
75-15-0	Carbon Disulfide	10	Ū	1
79-20-9	Methyl Acetate	10	Ū.	
75-09-2	Methylene Chloride	10 7	JBU	ı
156-60-5	trans-1,2-Dichloroethene	10	Ū	ĺ
1634-04-4	Methyl tert-Butyl Ether	10	UCAE	
75-34-3	1,1-Dichloroethane	10	U 7/23	ln3
156-59-2	cis-1,2-Dichloroethene	10	U	
78-93-3	2-Butanone	10	Ū	i
67-66-3	Chloroform	10	Ū	ŀ
71-55-6	1,1,1-Trichloroethane	10	Ū	l
110-82-7	Cyclohexane	10	Ū	ĺ
56-23-5	Carbon Tetrachloride	10	U	
71-43-2	Benzene	10	Ü	ĺ
107-06-2	1,2-Dichloroethane	10	U	1

EPA SAMPLE NO.

SW01PB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-1

Sample wt/vol:

(g/mL) ML

Lab File ID: RX1067-1A59

Level: (low/med) LOW

5

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

79-01-6	Trichloroethene	10 0
108-87-2	Methylcyclohexane	10 U
78-87-5	1,2-Dichloropropane	10 U
75-27-4	Bromodichloromethane	10 U
10061-01-5	cis-1,3-Dichloropropene	10 U
108-10-1	4-Methyl-2-Pentanone	10 U
108-88-3	Toluene	10 U
10061-02-6	trans-1,3-Dichloropropene	10 U
79-00-5	1,1,2-Trichloroethane	10 U
127-18-4	Tetrachloroethene	10 U
591-78-6	2-Hexanone	10 0
124-48-1	Dibromochloromethane	10 U
106-93-4	1,2-Dibromoethane	10 U
108-90-7	Chlorobenzene	10 0
100-41-4	Ethylbenzene	10 U
1330-20-7	Xylene (Total)	10 U
100-42-5	Styrene	10 U
75-25-2	Bromoform	10 U
98-82-8	Isopropylbenzene	10 U
79-34-5	1,1,2,2-Tetrachloroethane	10 0
541-73-1	1,3-Dichlorobenzene	. 10 U
106-46-7	1,4-Dichlorobenzene	10 U
95-50-1	1,2-Dichlorobenzene	10 U
96-12-8	1,2-Dibromo-3-Chloropropane	10 U
120-82-1	1,2,4-Trichlorobenzene	10 U

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SW01PB
5W-1
<u> </u>

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-1

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RX1067-1A59

Level: (low/med)

Date Received: 05/01/03

% Moisture: not dec. ___

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

LOW

CONCENTRATION UNITS:

Number TICs found: 0

(ug/L or ug/Kg) UG/L

1. 2. 3. 4. 5. 6. 7. 8. 9.	
3. 4. 5. 6. 7. 8. 9.	
4. 5. 6. 7. 8. 9.	
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FORM I VOA-TIC

EPA SAMPLE NO.

SW01DPPB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

SW-ID

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-2

Sample wt/vol:

5

(g/mL) ML

Lab File ID: RX1067-2A59

Date Received: 05/01/03

Level: (low/med) LOW

% Moisture: not dec. _____

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	Ü
75-01-4	Vinyl Chloride	10	Ū
74-83-9	Bromomethane	10	Ū
75-00-3	Chloroethane	10	Ū
75-69-4	Trichlorofluoromethane	10	Ū
75-35-4	1,1-Dichloroethene	10	Ū
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	· Ū
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	Ū
79-20-9	Methyl Acetate	10	Ū
75-09-2	Methylene Chloride .	10	Ū
156-60-5	trans-1,2-Dichloroethene	10	Ü
1634-04-4	Methyl tert-Butyl Ether	10	Ū
75-34-3	1,1-Dichloroethane	10	Ū
156-59-2	cis-1,2-Dichloroethene	10	บ
78-93-3	2-Butanone	10	Ü
67-66-3	Chloroform	10	Ū
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	Ū
56-23-5	Carbon Tetrachloride	10	Ū
71-43-2	Benzene	10	Ū
107-06-2	1,2-Dichloroethane	10	บ

FORM I VOA-1

EPA SAMPLE NO.

SW01DPPB
< W_11)

Lab Name: COMPUCHEM

Contract: OLM04-REVS

3W-1D

Lab Code: LIBRTY Case No.: SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-2

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RX1067-2A59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec. ____

Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

CAS NO. COMPOUND

79-01-6	Trichloroethene	10	<u> </u>
108-87-2	Methylcyclohexane	10	ן ט
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	Ū
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	Ū
106-93-4	1,2-Dibromoethane	10	Ū
108-90-7	Chlorobenzene	10	Ū
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	Ū
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	Ū
98-82-8	Isopropylbenzene	10	Ü
79-34-5	1,1,2,2-Tetrachloroethane	10	Ū
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	Ū
96-12-8	1,2-Dibromo-3-Chloropropane	10	Ū
120-82-1	1,2,4-Trichlorobenzene	10	U

FORM I VOA-2

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

SAS No.:

EPA SAMPLE NO.

SW01DPPB 3W-1D

Lab Name: COMPUCHEM

Contract: OLM04-REVS

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Code: LIBRTY Case No.:

Lab Sample ID: RX1067-2

Sample wt/vol: 5

(g/mL) ML

Lab File ID: RX1067-2A59

Level: (low/med)

LOW

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.		 		
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FORM I VOA-TIC

EPA SAMPLE NO.

SW04TBPB	
TB	

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-6

Sample wt/vol:

5 (g/mL) ML

Lab File ID: RX1067-6A59

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: __ (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

75-71-8	Dichlorodifluoromethane	10	Ū	
74-87-3	Chloromethane	10	Ū	1
75-01-4	Vinyl Chloride	10	Ū	
74-83-9	Bromomethane	10	Ū	
75-00-3	Chloroethane	10	Ū	1
75-69-4	Trichlorofluoromethane	10	U	
75-35-4	1,1-Dichloroethene	10	U	1
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	· U	Ì
67-64-1	Acetone	10	U)
75- 15- 0	Carbon Disulfide	10	Ū	
79-20-9	Methyl Acetate	10	ΰ,	}
75-09-2	Methylene Chloride	10 %	JBU	1
156-60-5	trans-1,2-Dichloroethene	10	U	ì
1634-04-4	Methyl tert-Butyl Ether	10	U CAE	1
75-34-3	1,1-Dichloroethane	10	U 7/2	3/c
156-59-2	cis-1,2-Dichloroethene	10	U	{
78-93-3	2-Butanone	10	_ Ŭ	
67-66-3	Chloroform	10	บั	
71-55-6	1,1,1-Trichloroethane	10	Ŭ	
110-82-7	Cyclohexane	10	Ū	1
56-23-5	Carbon Tetrachloride	10	Ü	
71-43-2	Benzene	10	U	l
107-06-2	1,2-Dichloroethane	10	Ü	

EPA SAMPLE NO.

Contract: OLM04-REVS SW04TBPB

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Lab Name: COMPUCHEM

Matrix: (soil/water) WATER Lab Sample ID: RX1067-6

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-6A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

79-01-6	Trichloroethene	10 0	
108-87-2	Methylcyclohexane	10 0	
78-87-5	1,2-Dichloropropane	10 U	
75-27-4	Bromodichloromethane	10 U	
10061-01-5	cis-1,3-Dichloropropene	10 U	
108-10-1	4-Methyl-2-Pentanone	10 U	
108-88-3	Toluene	10 0	
10061-02-6	trans-1,3-Dichloropropene	10 U	,
79-00-5	1,1,2-Trichloroethane	10 U	ŗ
127-18-4	Tetrachloroethene	10 U	,
591-78-6	2-Hexanone	10 U	
124-48-1	Dibromochloromethane	10 U	
106-93-4	1,2-Dibromoethane	10 U	J
108-90-7	Chlorobenzene	10 0	
100-41-4	Ethylbenzene	10 0	
1330-20-7	Xylene (Total)	10 U	
100-42-5	Styrene	10 0	
75 - 25-2	Bromoform	10 U	
98-82 - 8	Isopropylbenzene	10 U	
79-34-5	1,1,2,2-Tetrachloroethane	10 U	
541-73-1	1,3-Dichlorobenzene	10 U	
106-46-7	1,4-Dichlorobenzene	10 0	
95-50-1	1,2-Dichlorobenzene	10 U	
96-12-8	1,2-Dibromo-3-Chloropropane	10 U	
120-82-1	1,2,4-Trichlorobenzene	10 U	

FORM I VOA-2

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

SW04TBPB
SWOATBEB
 11/2
12

EPA SAMPLE NO.

Lab Name: COMPOCH	 •

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

LOW

Lab Sample ID: RX1067-6

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RX1067-6A59

Level: (low/med)

Date Received: 05/01/03

% Moisture: not dec.

Date Analyzed: 05/08/03

GC Column: ZB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: __ (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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20.				
22.		· · - · · · · · · · · · · · · · · · · ·		
23.				
10. 17. 18. 19. 20. 21. 22. 23. 24.				
25. 26. 27. 28.				
26.			- 	
21.				
29.				
29. 30.				 ,

FORM I VOA-TIC



DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

ORGANIC ANALYSIS DATA Semivolatiles in Water

SDG No. RX1067 April 2003 Sample Collections

Chemical Analyses Performed by: CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
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July 8, 2003



EXECUTIVE SUMMARY

Validation of the semivolatile organics analysis data prepared by CompuChem Environmental for five water samples from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RX1067, which was received for review on June 12, 2003. The following samples were reported:

PW01PB (PW-1) SW02PB (SW-5)	SW01PB (SW-1) SW03PB (SW-6)	SW01DPPB (SW-1D)
	(- ,	

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for hexachlorocyclopentadiene in all samples were qualified as estimated (UJ).
- Results for di-n-butylphthalate in SW01PB and SW02PB, for butylbenzylphthalate in PW01PB, SW01PB, SW01DPPB, and SW02PB, and for bis(2-ethylhexyl)phthalate in SW01PB, SW01DPPB, and SW03PB were qualified as less than the contract required quantitation limit (CRQL) (U).
- The result for caprolactam in SW01DPPB was qualified as less than the reported value (10 U).
- The result for the tentatively identified compound (TIC) at RT 5.7 minutes in SW01PB was rejected (R).
- To maintain consistency with historical project data, sample-specific CRQLs for four
 of the samples were adjusted by the validator as listed in Section XI to reflect the
 effective concentration factors applicable because more than 1000 mL of each
 affected sample was extracted.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the semivolatiles data.



INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Organics Analyses OLM04.2. Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in conformance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev 12), "Evaluation of Organics Data for the CLP," (3/01) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

- U The material was analyzed for, but was not detected above the reported sample quantitation limit.
- J- The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
- NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.



R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified, and the results are therefore unusable.

These codes are recorded on the customized data table contained in Attachment A and the Organic Analysis Data Sheets (Form Is) in Attachment B of this validation report to indicate qualifications placed on the data as a result of the review.

Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



and SW02PB, for butylbenzylphthalate in PW-1PB, SW01PB, SW01DPPB, and SW02PB, and for bis(2-ethylhexyl)phthalate in SW01PB, SW01DPPB, and SW03PB were qualified as less than the contract required quantitation limit (CRQL) based on the associated MB contamination.

No tentatively identified compounds were detected in the MB.

V. Surrogate Recoveries

Recoveries of the eight surrogate compounds in all site samples, spiked samples, and blanks were within the acceptance limits documented on the summary forms.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Sample SW01PB was prepared and analyzed as an MS/MSD pair. Percent recoveries and relative percent differences (RPDs) between paired recoveries were correctly calculated, accurately reported, and within the acceptance limits documented on Form 3 except for the recoveries of nitrophenol (100% and 109%; QC 10-80%) and pentachlorophenol (133% and 133%; QC 9-103%). These high recoveries suggest the possibility of reporting false positives or detected results that are biased high. Since neither analyte was detected in the unspiked sample, no action was taken on this basis.

A comparison of results for non-blank-related, unspiked target analytes in SW01PB, the MS, and the MSD was made. Agreement among the three results for diethylphthalate (26.6 %RSD) was acceptable. Caprolactam was detected in the MSD (26 $\mu g/L$) but was not found in the original sample analysis or in the MS (10 U). Since caprolactam was not reported in the unspiked sample and has not previously been found at this sample location, no action was taken by the validator on this basis.

VII. Field Duplicates

Sample SW01DPPB was identified as a field duplicate of SW01PB. After qualifications based on associated blank contamination, caprolactam was reported in SW01DPPB (10 µg/L), but was not found in SW01PB (9 U). Based on professional judgment, the result for caprolactam in SW01DPPB was qualified as less than the reported value (10 U) due to this lack of confirmation in the field duplicate analyses.

No TICs were reported in SW01DPPB, but a TIC at 5.7 minutes was reported as an unknown at an estimated concentration of 3 μ g/L in SW01PB. Visual inspection of the chromatogram for SW01DPPB did not reveal a peak present at the same RT as the TIC found in SW01PB. Due to lack



of confirmation in the field duplicate analyses, the results for the TIC at RT 5.7 minutes in SW01PB was rejected (R).

VII. Internal Standard (IS) Performance

All IS areas and RTs were within the acceptance limits (>50% and <200% of the area responses in the associated CC standard and within ±30 seconds, respectively) in all reported sample analyses.

IX. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the applicable data package.

X. Compound Quantitation and Reported Detection Limits

Target compound concentrations were correctly calculated and accurately reported for all reported sample analyses, including adjustments for the extraction of slightly more than 1000 mL of all samples.

Adjustments were not made by the laboratory to the CRQLs to reflect the concentration factors applicable when more than 1000 mL of the sample was extracted. Although lowering the CRQLs under these circumstances is not required by the SOW and reporting the routine CRQLs is not technically incorrect, this adjustment has been made by the laboratory on previous data sets generated for this project. Therefore, to maintain consistency with historical project data, CRQLs for the following samples were adjusted by the validator to reflect extraction of slightly larger sample volumes than specified by the SOW:

Sample ID	Laboratory- Reported CRQLs	Volume Extracted/ Concentration Factor	Validator- Adjusted CRQLs
PW01PB	10/25 μg/L	1025 mL	10/24 μg/L
SW01DPPB	10/25 μg/L	1100 mL	9/23 μg/L
SW02PB	10/25 μg/L	1125 mL	9/22 μg/L
SW03PB	10/25 μg/L	1100 mL	9/23 μg/L



The data table in Attachment A lists all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific CRQLs may be found on the laboratory-generated Form I for each sample (Attachment B) and on the data table.

XI. Tentatively Identified Compounds (TIC)

One TIC was reported in each of three of the site samples in this data set, one of which was reported as an alkane. No TICs were found in the remaining samples. As previously discussed (Section VII), the TIC reported in SW01PB was rejected. No additional action by the validator was necessary with respect to the reported TIC results.

All reported TICs were appropriately qualified as "J" by the laboratory to emphasize that these are *estimated* concentrations. These "J" qualifiers were not removed by the validator.

The Form I-TIC for each sample, as reported by the laboratory and with qualifiers and corrections noted as described above, are included in Attachment B to this report.

XIL System Performance

The analytical system appears to have been working within method specifications at the time of these analyses, based on evaluation of the available raw data.

XII. Documentation

The samples reported in SDG No. RX1067 were recorded on a single chain of custody (COC) record which was included in the data package. The following issues were noted:

- Copies of courier airbills were not included in either data package to document the shipment portion of the sample transfers. Airbill numbers, however, were documented on both of the COC records.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.



XIV. Overall Assessment

Sample results were determined to be valid as reported with the following exceptions:

- Results for hexachlorocyclopentadiene in all samples were qualified as estimated (UJ) based on a very high %D value for this analyte in the associated CC standard.
- Results for di-n-butylphthalate in SW01PB and SW02PB, for butylbenzylphthalate in PW-1PB, SW01PB, SW01DPPB, and SW02PB, and for bis(2-ethylhexyl)phthalate in SW01PB, SW01DPPB, and SW03PB were qualified as less than the CRQL based on associated MB contamination.
- Based on professional judgment, the result for caprolactam in SW01DPPB was
 qualified as less than the reported value (10 U) due to lack of confirmation in the field
 duplicate analyses.
- Due to lack of confirmation in the field duplicate analyses, the TIC at RT 5.7 minutes in SW01PB was rejected (R).
- To maintain consistency with historical project data, sample-specific CRQLs for four of the samples were adjusted by the validator as listed in Section XI to reflect the effective concentration factors applicable because more than 1000 mL of each affected sample was extracted.

Documentation issues are discussed in Section XIII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the semivolatiles data.



ATTACHMENT A

DATA TABLE SDG No. RX1067 Semivolatiles in Water Marion Bragg Landfill - April 2003

Collection Point	 >	PW-I	SW-1	SW-ID	SW-5	SW-6
Sample ID	===>	PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No.	 >	RX1067-5	RX1067-1	RX1067-2	RX1067-3	RX1067-4
Collection Date. ====>		4/29/03 0.9 8	4/29/03 1.00	4/29/03 0.91	4/29/03 0. 8 9	4/29/03 0.91
CARGINANT LAW>	CRQL	0.56	1.00	0.91	0.67	0.71
Benzaldeliyde	10	10 U	10 U	9 U	9 U	9 U
Phenol	10	10 U	10 U	9 U	∙9 U	9 U
is(2-Chloroethyl)ether	10	10 U	10 U	9 U	9 U	9 U
-Chlorophenol	10	10 U	10 U	9 U	9 U	9 U
-Methylphenol , 2'-oxybis(1-Chloropropane)	10 10	10 U 10 U	10 U 10 U	9 U 9 U	9 U 9 U	9 U 9 U
,,2-oxyona (1-Canoropropanie) Acetophenone	10	10 U	10 U	9 U	9 U	9 U
-Methylphenol	10	10 U	10 U	9 U	9Ü	9 U
V-Nitroso-di-n-propylamine	10	10 U	10 U	9 U	9 U	9 U
lexachloroethane	10	10 U	10 U	9 U	9 U	9. U
Sitrobenzene	10	10 U	10 U	9 U	9 U	9 U
sophorone	10	10 U	10 U	9 U	9 U	9 U
!-Nitrophenol !,4-Dimethylphenol	10 10	10 U 10 U	10 U 10 U	9 U 9 U	9 U 9 U	9 U 9 U
oin(2-Chloroethoxy)methane	10	10 U	10 U	9 U	9 U	9 U
2,4-Dichlorophenol	10	10 U	10 U	9 U	9 U	9 U
laphthalene	10	10 U	10 U	9 U	9 U	9 U
-Chloroaniline	10	10 U	10 U	9 U	9 U	9 U
lexachlorobutadiene	10	10 U	10 U	9 U	9 U	9 U
Caprolactam	10	10 U	10 U	10 U	18	9 U
-Chioro-3-methylphenol -Methylnaphthalene	10 10	10 U 10 U	10 U 10 U	9 U 9 U	9 U 9 U	9 U
lexachlorocyclopentadiene	10	10 UJ	10 UJ	9 UJ	9 UJ	9 U
2,4,6-Trichlorophenol	10	10 U	10 U	9 U	9 U	9 U
2,4,5-Trichlorophenol	25	24 U	25 U	23 U	22 U	23 U
,1'-Biphonyl	10	10 U	10 U	9 U	9 U	9 U
-Chloronaphthalene	10	10 U	10 U	9 U	9 U	9 L
-Nitroaniline	25	24 U	25 U	23 U 9 U	22 U 9 U	23 U 9 U
Dimethylphthalate 1,6-Dimitrotoluene	10 10	10 U 10 U	10 U 10 U	9 U	9 U	9 U
Acenaphthylene	10	10 U	10 U	9 U	9 U	ýυ
-Nitroaniline	25	24 U	25 U	23 U	22 U	23 (
Acenaphthene	10	10 U	10 U	9 U	10 U	9 t
,4-Dinitrophenol	25	24 U	25 U	23 U	22 U	23 t
-Nitrophanol	25	24 U	25 U	23 U	22 U	23 [
Dibenzofuran 4-Dinitrotoluene	10 10	10 U 10 U	10 U 10 U	9 U 9 U	9 U. 9 U	9 L 9 L
Xiethylphthalate	10	10 U	10 U	9 U	0.4 J	9 t
luorene	10	10 U	10 U	9 U	9 U	9 [
-Chiorophenyl-phenylether	10	10 U	10 U	9 U	9 U	9 t
-Nitroaniline	25	24 U	25 U	23 U	22 U	23 t
6-Dinitro-2-methylphenol	25	24 U	25 U	23 U	22 U	23 L
I-nitrosodiphenylamine	10	10 U	10 U	9 U	9 U 9 U	9 t
-1910mopaeny1-pneny1ctner lexachlorobenzene	10 10	10 U 10 U	10 U 10 U	9 U 9 U	9 U	9 t 9 t
trazine	10	10 U	10 U	ýΰ	9 Ŭ	ýτ
entachlorophenol	25	24 U	25 U	23 U	22 U	23 (
henanthrene	10	10 U	10 U	9 U	9 U	9 L
infhracene	10	10 U	10 U	9 U	9 U	9 (
larbazole	10	10 U	10 U	9 U	9 U	9 t
)i-n-butylphthalate luoranthene	10 10	10 U 10 U	10 U 10 U	9 U 9 U	9 U 9 U	9 t 3 e
ANDERSON STATE	10	10 U	10 U	9 U	9 U	9 t
utylbenzylphthalate	10	10 U	10 U	9 U	9 U) () (
3'-Dichlorobenzidine	10	10 U	10 U	9 U	9 U	9 τ
lenzo(a)anthracene	10	10 U	10 U	9 U	9 U	9 τ
hrysene	10	10 U	10 U	9 U	9 U	9 (
io(2-Ethylhexyl)phthalate	10	10 U	10 U	9 U	9 U	9 [
)i-n-octylphthalate	10	10 U	10 U	9 U	9 U	9 (
lenzo(b)fluoranthene lenzo(k)fluoranthene	10 10	10 U 10 U	10 U 10 U	9 U 9 U	9 U 9 U	9 t 9 t
Senzo(k)njuoranimene Senzo(a)pyrene	10	10 U	10 U	9 U	9 U	9 L
ndeno(1,2,3-cd)pyrene	10	10 U	10 U	9 U	9 U	9 [
Dibenzo(a,h)anthracene	10	10 U	10 U	9 U	9 U	9 t

EPA SAMPLE NO.

Lab Name: COMPUCHEM Contract: OLM04-REVS

PW-1

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-5

Sample wt/vol:

1025 (g/mL) ML

Lab File ID: RX1067-5A70

Level:

(low/med)

LOW

Date Received: 05/01/03

% Moisture:

. . .

N

_____ decanted: (Y/N)____

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000(uL)

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)

pH: 6.0

Extraction:

(Type) CONT

CONCENTRATION UNITS:

COMPOUND

(ug/L or ug/Kg) <u>UG/L</u> (

100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	Ŭ
111-44-4	bis(2-Chloroethyl)ether	10	Ū
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
98-86-2	Acetophenone	10	Ü
106-44-5	4-Methylphenol	10	Ū
621-64-7	N-Nitroso-di-n-propylamine	10	Ü
67-72-1	Hexachloroethane	1.0	Ū
98-95-3	Nitrobenzene	10	Ū
78-59-1	Isophorone	10	Ū
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	Ū
111-91-1	bis(2-Chloroethoxy)methane	10	Ü
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	_ U
87-68-3	Hexachlorobutadiene	10	Ū
105-60-2	Caprolactam	10	Ū
59-50-7	4-Chloro-3-methylphenol	10	Ū
91-57-6	2-Methylnaphthalene	10	Ŭ
77-47-4	Hexachlorocyclopentadiene	10	ZUJ
88-06-2	2,4,6-Trichlorophenol	10	ט
95-95-4	2,4,5-Trichlorophenol	24 25	ט
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	Ū
88-74-4	2-Nitroaniline	24 25	Ū
131-11-3	Dimethylphthalate	10	Ū
606-20-2	2,6-Dinitrotoluene	10	Ū
208-96-8	Acenaphthylene	10	Ü
99-09-2	3-Nitroaniline	a4 25	U
83-32 - 9	Acenaphthene	10	Ū
		116. V/m 7/d.	

FORM I SV-1

Carulton 7/8/03 OLMO4.2

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Contract: OLM04-REVS Lab Name: COMPUCHEM

PW01PB DW-1

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-5

Sample wt/vol:

1025 (g/mL) ML

Lab File ID: RX1067-5A70

Level:

(low/med)

LOW

Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 6.0

Extraction:

(Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L Q

1			
51-28-5	2,4-Dinitrophenol	24 25	Ŭ
100-02-7	4-Nitrophenol	24 -25-	ט
132-64-9	Dibenzofuran	10	ט
121-14-2	2,4-Dinitrotoluene	10	<u>U</u>
84-66-2	Diethylphthalate	10	מ
86-73-7	Fluorene	10	ט
7005-72-3	4-Chlorophenyl-phenylether	10	Ü
100-01-6	4-Nitroaniline	24 25	Ū
534-52-1	4,6-Dinitro-2-methylphenol	24 25	Ū
86-30-6	N-nitrosodiphenylamine (1)	7 10	Ū
101-55-3	4-Bromophenyl-phenylether	10	Ü
118-74-1	Hexachlorobenzene	10	Ū
1912-24-9	Atrazine	10	Ū
87-86-5	Pentachlorophenol	24 25	Ū
85-01-8	Phenanthrene	10	Ū
120-12-7	Anthracene	10	Ū
86-74-8	Carbazole	10	Ū
84-74-2	Di-n-butylphthalate	10	Ū
206-44-0	Fluoranthene	10	Ü
129-00-0	Pyrene	10	Ū
85-68-7	Butylbenzylphthalate	10 -0.2	JB- U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a) anthracene	10	Ū
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	Ū
117-84-0	Di-n-octylphthalate	10	Ū
205-99-2	Benzo(b)fluoranthene	10	Ū
207-08-9	Benzo(k)fluoranthene	10	Ū
50-32-8	Benzo(a) pyrene	10	Ū
193-39-5	Indeno(1,2,3-cd)pyrene	10	Ū
53-70-3	Dibenzo (a, h) anthracene	10	Ü
191-24-2	Benzo(g,h,i)perylene	10	Ū
	annot be separated from Diphenylamine	MG. YLou, ale	<u>-</u>

CaEuxson 7/8/03

FORM I SV-2

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

PW01PB

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-5

Sample wt/vol: 1025 (g/mL)

Lab File ID: RX1067-5A70

Level: (low/med)

Concentrated Extract Volume:

LOW

ML

Date Received: 05/01/03

% Moisture: Decanted: (Y/N) Date Extracted:05/05/03

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 6.0

1000 (uL)

Extraction: (Type) CONT

Number TICs found: 0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
•		_=======		====
1.				
3.				
4.				
5.			'	
6.				
7.				
8.				
9.				
10.				
11. 12.				
13.				
14.		<u> </u>		
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27. 28.				
29.				
30.				

FORM I SV-TIC

1G

Lab Name: COMPUCHEM

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

PW01PB Contract: OLM04-REVS PW -1

EPA SAMPLE NO.

SDG No.: RX1067 Lab Code: LIBRTY Case No.: SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: RX1067-5

Sample wt/vol: 1025 (g/mL) Lab File ID: RX1067-5A70 ML

Level: (low/med) LOW Date Received: 05/01/03

Concentrated Extract Volume: Date Analyzed: 05/08/03 1000(uL)

Dilution Factor: 1.0 Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
		======	*******	
1.				
3.				
4.				
5.				
6.		[
7.				
				
8. 9.				
10.				
11.				
12.				
13.				
14. 15.				
15.				
16.				
17				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25. 26.				
27.				
28.				
29.		- 		
30.				

FORM I SV-TIC

ALKANE NARRATIVE REPORT Report date : 05/14/2003 SDG: RX1067

PW-1 Client Sample ID: PW01PB Compound	Lab Sample	ID: RX1067-5 RT Est.		ID: RX1067-5A70 Q
Unknown Alkane		6.75	3	J

EPA SAMPLE NO.

SW01PB Contract: OLM04-REVS

Lab Name: COMPUCHEM

Lab Code: LIBRTY Case No.: SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-1

Sample wt/vol:

1000 (g/mL) ML Lab File ID: RX1067-1A70

Level:

(low/med)

LOW

Date Received: 05/01/03

% Moisture:

____ decanted: (Y/N)___

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

		•	
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	Ü
111-44-4	bis(2-Chloroethyl)ether	10	Ū
95-57-8	2-Chlorophenol	10	Ū.
95-48-7	2-Methylphenol	10	Ū
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	Ū
67-72-1	Hexachloroethane	10	Ū
98-95-3	Nitrobenzene	10	Ū
78-59-1	Isophorone	10	Ū
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	Ü
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	10	Ū
91-20-3	Naphthalene	10	Ū
106-47-8	4-Chloroaniline	10	Ū
87-68-3	Hexachlorobutadiene	10	Ū
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	Ū
91-57-6	2-Methylnaphthalene	10	Ū
77-47-4	Hexachlorocyclopentadiene	10	VUJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U cae
92-52-4	1,1'-Biphenyl	10	U #8/0
91-58-7	2-Chloronaphthalene	10	
88-74-4	2-Nitroaniline	25	Ū
131-11-3	Dimethylphthalate	10	Ū
606-20-2	2,6-Dinitrotoluene	10	Ū
208-96-8	Acenaphthylene	10	Ū
99-09-2	3-Nitroaniline	25	Ū
83-32-9	Acenaphthene	10	Ü

FORM I SV-1

EPA SAMPLE NO.

SW01PB Contract: OLM04-REVS

Lab Name: COMPUCHEM

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-1

Sample wt/vol:

1000 (g/mL) ML

Lab File ID: RX1067-1A70

Level:

(low/med) LOW

Date Received: 05/01/03

% Moisture: ____ decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

		- 	
51-28-5	2,4-Dinitrophenol	25	Ŭ
100-02-7	4-Nitrophenol	25	Ü
132-64-9	Dibenzofuran	10	ช
121-14-2	2,4-Dinitrotoluene	10	Ū
84-66-2	Diethylphthalate	10 -0-5	チル
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	Ū
100-01-6	4-Nitroaniline	25	Ū
534-52-1	4,6-Dinitro-2-methylphenol	25	Ū
86-30-6	N-nitrosodiphenylamine (1)	10	Ū
101-55-3	4-Bromophenyl-phenylether	10	Ū
118-74-1	Hexachlorobenzene	10	Ū
1912-24-9	Atrazine	10	Ū
87-86-5	Pentachlorophenol	25	Ū
85-01-8	Phenanthrene	10	Ū
120-12-7	Anthracene	10	Ü
86-74-8	Carbazole	10	Ü
84-74-2	Di-n-butylphthalate	10 9.5	JB. U
206-44-0	Fluoranthene	10	Ū
129-00-0	Pyrene	10	Ū
85-68-7	Butylbenzylphthalate	10 0.3	JB- U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	<u> </u>
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 -0.6	JB 11
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b) fluoranthene	10	Ū
207-08-9	Benzo(k) fluoranthene	10	Ū
50-32-8	Benzo(a) pyrene	10	Ū
193-39-5	Indeno(1,2,3-cd)pyrene	10	Ū
53-70-3	Dibenzo (a, h) anthracene	10	Ü
191-24-2	Benzo(g,h,i)perylene	10	Ü
	annot be separated from Diphenylamine	M. G Ve - I plat -	

Cannot be separated from Diphenylamine

Ca Evikson 7/8/03

FORM I SV-2

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM Contract: OLM04-REVS

SW01PB 5W-1

EPA SAMPLE NO.

Lab Code: LIBRTY Case No.: SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-1

Sample wt/vol: 1000 (g/mL) ML

LOW

Lab File ID: RX1067-1A70

Level:

(low/med)

Date Received: 05/01/03

_____ Decanted: (Y/N)___

1000 (uL)

Date Extracted: 05/05/03

Concentrated Extract Volume:

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type) CONT

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
CAS NOMBER	ELECTRONIC NAME	K1	ESEREEREERE	
	UNKNOWN	5.69		J. P
$\left \begin{array}{c} 1 \\ \hline 2 \end{array} \right $	OMETOWN	3.03		<u> </u>
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			CAE	7/8/03
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FORM I SV-TIC

OLMO4.2

SAS No.:

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Contract: OLM04-REVS

SW01DPPB 5W-ID

Lab Name: COMPUCHEM

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-2

Sample wt/vol:

Lab Code: LIBRTY

(q/mL) ML 1100

Lab File ID: RX1067-2A70

Level:

(low/med) LOW Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

N

Case No.:

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)

pH: 7.0

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u> Q

100-52-7	Benzaldehyde	910	Ü
108-95-2	Phenol	, 10	Ü
111-44-4	bis(2-Chloroethyl)ether	10	Ū
95-57-8	2-Chlorophenol		U
95-48-7	2-Methylphenol	10	Ū
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
98-86-2	Acetophenone	10	Ū
106-44-5	4-Methylphenol	10	Ū
621-64-7	N-Nitroso-di-n-propylamine	1.0	Ü
67-72-1	Hexachloroethane	1-0	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	Ü
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	Ü
111-91-1	bis(2-Chloroethoxy)methane	1.0	Ü
120-83-2	2,4-Dichlorophenol	10	Ū
91-20-3	Naphthalene	10	U.z
106-47-8	4-Chloroaniline	10	U COL
87-68-3	Hexachlorobutadiene	10 /	10 US-1
105-60-2	Caprolactam	10	1 4 1
59-50-7	4-Chloro-3-methylphenol	10	Ü
91-57-6	2-Methylnaphthalene	1.0	Ū
77-47-4	Hexachlorocyclopentadiene	1 2-0	BUT
88-06-2	2,4,6-Trichlorophenol	9 10	Ū
95-95-4	2,4,5-Trichlorophenol	23 25	Ü
92-52-4	1,1'-Biphenyl	910	Ū
91-58-7	2-Chloronaphthalene	q 10	Ū
88-74-4	2-Nitroaniline	23 25	Ū
131-11-3	Dimethylphthalate	4 10	Ü
606-20-2	2,6-Dinitrotoluene	910	Ū
208-96-8	Acenaphthylene	9 10	Ü
99-09-2	3-Nitroaniline	2325	U
83-32-9	Acenaphthene	9 10	Ū

FORM I SV-1

Carrikson 7/8/03

EPA SAMPLE NO.

SW01DPPB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

SW-1D

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-2

Sample wt/vol:

1100 (g/mL) ML

Lab File ID: RX1067-2A70

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture:

_____ decanted: (Y/N)____

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

Extraction: (Type) CONT

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

CONCENTRATION UNITS:

51-28-5	2,4-Dinitrophenol	33.25	U
		23 25	Ü
100-02-7	4-Nitrophenol	23 25	
132-64-9	Dibenzofuran	9 1.0	Ü
121-14-2	2,4-Dinitrotoluene	, 1 0	Ü
84-66-2	Diethylphthalate	10	Ü
86-73-7	Fluorene	1 10	Ū
7005-72-3	4-Chlorophenyl-phenylether	9 10	Ū
100-01-6	4-Nitroaniline	2325	Ū
534-52-1	4,6-Dinitro-2-methylphenol	23 25	ט
86-30-6	N-nitrosodiphenylamine (1)	910	Ū
101-55-3	4-Bromophenyl-phenylether	110	U
118-74-1	Hexachlorobenzene	/ 10	Ū
1912-24-9	Atrazine	9 20	U
87-86-5	Pentachlorophenol	a3 25	Ū
85-01-8	Phenanthrene	910	U
120-12-7	Anthracene	, 10	Ū
86-74-8	Carbazole	(10	Ü
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	Ū
129-00-0	Pyrene	. 10	Ū
85-68-7	Butylbenzylphthalate	9 0.2	JB- U
91-94-1	3,3'-Dichlorobenzidine	, 10	U
56-55-3	Benzo(a)anthracene	10	Ū
218-01-9	Chrysene	10	Ū
117-81-7	bis(2-Ethylhexyl)phthalate	9 0.5	JB- //
117-84-0	Di-n-octylphthalate	1, 10	U
205-99-2	Benzo(b)fluoranthene	1 10	Ū
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	Ü
193-39-5	Indeno(1,2,3-cd)pyrene	10	บ
53-70-3	Dibenzo(a, h) anthracene	10	Ü
191-24-2	Benzo(g,h,i)perylene	9 10	Ū
(1) - Ca	nnot be separated from Diphenylamine	Caritson.	
	EODM T CV 2	- •	07.140.4

FORM I SV-2

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

SW01DPPB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

SW-10

EPA SAMPLE NO.

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-2

Sample wt/vol: 1100 (g/mL) ML

Lab File ID: RX1067-2A70

Level: (low/med)

LOW

Date Received: 05/01/03

% Moisture: ____ Decanted: (Y/N) ___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 05/08/03

Injection Volume: 2.0(uL)

Number TICs found: 0

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Extraction: (Type) CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER COMPOUND NAME RTEST. CONC. Q -------------------------3. 4. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28.

FORM I SV-TIC

OLMO4.2

EPA SAMPLE NO.

Contract: OLM04-REVS

SW02PB

Lab Name: COMPUCHEM

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-3

Sample wt/vol: 1125 (g/mL) ML

Lab File ID: RX1067-3A70

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)____

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/08/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Extraction: (Type) CONT

CAS NO. COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

108-95-2 Phenol	100-52-7	Benzaldehyde	9 10	Ū
95-57-8 2-Chlorophenol 10 95-48-7 2-Methylphenol 10 10 10 10 10 10 10 1	108-95-2	Phenol	10	Ū
95-48-7 2-Methylphenol 108-60-1 2,2'-oxybis(1-Chloropropane) 140 U 108-60-1 2,2'-oxybis(1-Chloropropane) 140 U 106-60-1 2,2'-oxybis(1-Chloropropane) 140 U 106-60-2 Acetophenone 140 U 106-64-5 4-Methylphenol 100 U 106-64-5 4-Methylphenol 100 U 106-64-7 N-Nitroso-di-n-propylamine 170 U 100			\ 10	
108-60-1 2,2'-oxybis(1-Chloropropane) 10 U 98-86-2 Acetophenone 10 U U U U U U U U U	95-57-8		110	Ū
98-86-2 Acetophenone 1.0 U	95-48-7		10	Ü
106-44-5	108-60-1	2,2'-oxybis(1-Chloropropane)	1-0	Ū
10 10 10 10 10 10 10 10	98-86-2		110	Ū
10 10 10 10 10 10 10 10	106-44-5	4-Methylphenol	10	Ū
67-72-1 Hexachloroethane 10 U 98-95-3 Nitrobenzene 10 U 78-59-1 Isophorone 10 U 88-75-5 2-Nitrophenol 10 U 105-67-9 2,4-Dimethylphenol 10 U 111-91-1 bis (2-Chloroethoxy) methane 10 U 120-83-2 2,4-Dichlorophenol 10 U 91-20-3 Naphthalene 10 U 106-47-8 4-Chloroaniline 10 U 87-68-3 Hexachlorobutadiene 9 U 105-60-2 Caprolactam 18 18 59-50-7 4-Chloro-3-methylphenol 9 19 91-57-6 2-Methylnaphthalene 9 10 77-47-4 Hexachlorocyclopentadiene 10 10 88-06-2 2,4,5-Trichlorophenol 2,25 U 92-52-4 1,1'-Biphenyl 9 10 91-58-7 2-Chloronaphthalene 9 10 U 88-74-4 2-Nitroaniline 22,25 U 131-11-3			10	
78-59-1 Isophorone 10 U 88-75-5 2-Nitrophenol 10 U 105-67-9 2,4-Dimethylphenol 10 U 111-91-1 bis(2-Chloroethoxy)methane 10 U 120-83-2 2,4-Dichlorophenol 10 U 91-20-3 Naphthalene 10 U 106-47-8 4-Chloroaniline 10 U 87-68-3 Hexachlorobutadiene 7 10 U 105-60-2 Caprolactam 18 18 59-50-7 4-Chloro-3-methylphenol 94-0 U 91-57-6 2-Methylnaphthalene 74-0 U 77-47-4 Hexachlorocyclopentadiene 74-0 U 88-06-2 2,4,6-Trichlorophenol 91-0 U 95-95-4 2,4,5-Trichlorophenol 92-25-0 U 91-58-7 2-Chloronaphthalene 91-0 U 88-74-4 2-Nitroaniline 22-25-0 U 131-11-3 Dimethylphthalate 91-0 U 606-20-2 2,6-Dinitrotoluene 91-0 U	67-72-1	Hexachloroethane	10	
88-75-5 2-Nitrophenol 10 U 105-67-9 2,4-Dimethylphenol 10 U U 111-91-1 bis (2-Chloroethoxy) methane 10 U U 120-83-2 2,4-Dichlorophenol 10 U U U U U U U U U	98-95-3	Nitrobenzene	110	Ū
105-67-9 2,4-Dimethylphenol 10			10	
111-91-1 bis (2-Chloroethoxy) methane 10 U 120-83-2 2,4-Dichlorophenol 10 U 91-20-3 Naphthalene 10 U 106-47-8 4-Chloroaniline 10 U 87-68-3 Hexachlorobutadiene 7 U 105-60-2 Caprolactam 18 59-50-7 4-Chloro-3-methylphenol 9 U 91-57-6 2-Methylnaphthalene 7 U 77-47-4 Hexachlorocyclopentadiene 7 U 88-06-2 2,4,6-Trichlorophenol 9 19 U 95-95-4 2,4,5-Trichlorophenol 9 19 U 92-52-4 1,1'-Biphenyl 9 9 10 U 88-74-4 2-Nitroaniline 22 25 U 88-74-4 2-Nitroaniline 22 25 U 131-11-3 Dimethylphthalate 9 10 U 208-96-8 Acenaphthylene 9 10 U 208-96-8 Acenaphthylene 9 10 U			120	
111-91-1 bis (2-Chloroethoxy) methane 10 U 120-83-2 2,4-Dichlorophenol 10 U 91-20-3 Naphthalene 10 U 106-47-8 4-Chloroaniline 10 U 87-68-3 Hexachlorobutadiene 7 U 105-60-2 Caprolactam 18 59-50-7 4-Chloro-3-methylphenol 9 U 91-57-6 2-Methylnaphthalene 7 U 77-47-4 Hexachlorocyclopentadiene 7 U 88-06-2 2,4,6-Trichlorophenol 9 19 U 95-95-4 2,4,5-Trichlorophenol 9 19 U 92-52-4 1,1'-Biphenyl 9 9 10 U 88-74-4 2-Nitroaniline 22 25 U 88-74-4 2-Nitroaniline 22 25 U 131-11-3 Dimethylphthalate 9 10 U 208-96-8 Acenaphthylene 9 10 U 208-96-8 Acenaphthylene 9 10 U	105-67-9		1-0	
91-20-3 Naphthalene 106-47-8 4-Chloroaniline 1-0 U W U W W W W W W		bis(2-Chloroethoxy)methane	1:0	Ü
106-47-8 4-Chloroaniline 10 87-68-3 Hexachlorobutadiene 9 10 105-60-2 Caprolactam 18 59-50-7 4-Chloro-3-methylphenol 9 19 91-57-6 2-Methylnaphthalene (10 10 77-47-4 Hexachlorocyclopentadiene 10 10 88-06-2 2,4,6-Trichlorophenol 9 10 95-95-4 2,4,5-Trichlorophenol 9 10 92-52-4 1,1'-Biphenyl 9 10 91-58-7 2-Chloronaphthalene 9 10 10 88-74-4 2-Nitroaniline 22-25 10 131-11-3 Dimethylphthalate 9 10 10 606-20-2 2,6-Dinitrotoluene 9 10 10 208-96-8 Acenaphthylene 9 10 10 99-09-2 3-Nitroaniline 22-25 10			10	
87-68-3 Hexachlorobutadiene 9 10 U 105-60-2 Caprolactam 18 59-50-7 4-Chloro-3-methylphenol 9 10 U 91-57-6 2-Methylnaphthalene (10 U 77-47-4 Hexachlorocyclopentadiene 10 U 88-06-2 2,4,6-Trichlorophenol 9 10 U 95-95-4 2,4,5-Trichlorophenol 22 25 U 92-52-4 1,1'-Biphenyl 9 10 U 91-58-7 2-Chloronaphthalene 9 10 U 88-74-4 2-Nitroaniline 22 25 U 131-11-3 Dimethylphthalate 9 10 U 606-20-2 2,6-Dinitrotoluene 9 10 U 208-96-8 Acenaphthylene 9 10 U 99-09-2 3-Nitroaniline 22 25 U	91-20-3		120	
105-60-2 Caprolactam 18 59-50-7 4-Chloro-3-methylphenol 9 10 U 91-57-6 2-Methylnaphthalene (10 U 77-47-4 Hexachlorocyclopentadiene 10 U 88-06-2 2,4,6-Trichlorophenol 9 10 U 95-95-4 2,4,5-Trichlorophenol 2,25 U 92-52-4 1,1'-Biphenyl 9 10 U 91-58-7 2-Chloronaphthalene 9 10 U 88-74-4 2-Nitroaniline 22.25 U 131-11-3 Dimethylphthalate 9 10 U 606-20-2 2,6-Dinitrotoluene 9 10 U 208-96-8 Acenaphthylene 9 10 U 99-09-2 3-Nitroaniline 22.25 U			10	Ü
59-50-7 4-Chloro-3-methylphenol 91-9 U 91-57-6 2-Methylnaphthalene (10 U 77-47-4 Hexachlorocyclopentadiene /10 U////////////////////////////////////			9 10	Ū
91-57-6 2-Methylnaphthalene (±0 U 77-47-4 Hexachlorocyclopentadiene /10 U////////////////////////////////////		Caprolactam	18	
77-47-4 Hexachlorocyclopentadiene /10 VU.T 88-06-2 2,4,6-Trichlorophenol 910 U 95-95-4 2,4,5-Trichlorophenol 225 U 92-52-4 1,1'-Biphenyl 910 U 91-58-7 2-Chloronaphthalene 910 U 88-74-4 2-Nitroaniline 22.25 U 131-11-3 Dimethylphthalate 910 U 606-20-2 2,6-Dinitrotoluene 910 U 208-96-8 Acenaphthylene 92-09-2 3-Nitroaniline 22.25 U				
88-06-2 2,4,6-Trichlorophenol 910 0 95-95-4 2,4,5-Trichlorophenol 2,25 0 92-52-4 1,1'-Biphenyl 910 0 91-58-7 2-Chloronaphthalene 910 0 88-74-4 2-Nitroaniline 22.25 0 131-11-3 Dimethylphthalate 910 0 606-20-2 2,6-Dinitrotoluene 910 0 208-96-8 Acenaphthylene 910 0 99-09-2 3-Nitroaniline 22.25 0				Ŭ.
88-06-2 2,4,6-Trichlorophenol 910 0 95-95-4 2,4,5-Trichlorophenol 2,25 0 92-52-4 1,1'-Biphenyl 910 0 91-58-7 2-Chloronaphthalene 910 0 88-74-4 2-Nitroaniline 22.25 0 131-11-3 Dimethylphthalate 910 0 606-20-2 2,6-Dinitrotoluene 910 0 208-96-8 Acenaphthylene 910 0 99-09-2 3-Nitroaniline 22.25 0		Hexachlorocyclopentadiene	/ 10	VUI
92-52-4 1,1'-Biphenyl 91-0 U 91-58-7 2-Chloronaphthalene 910 U 88-74-4 2-Nitroaniline 22-25 U 131-11-3 Dimethylphthalate 910 U 606-20-2 2,6-Dinitrotoluene 910 U 208-96-8 Acenaphthylene 910 U 99-09-2 3-Nitroaniline 22-25 U	88-06-2	2,4,6-Trichlorophenol		ΰ
91-58-7 2-Chloronaphthalene 910 U 88-74-4 2-Nitroaniline 22-25 U 131-11-3 Dimethylphthalate 910 U 606-20-2 2,6-Dinitrotoluene 910 U 208-96-8 Acenaphthylene 99-09-2 3-Nitroaniline 22-25 U	95 - 95-4			ับ
88-74-4 2-Nitroaniline 22-25 U 131-11-3 Dimethylphthalate 9 10 U 606-20-2 2,6-Dinitrotoluene 910 U 208-96-8 Acenaphthylene 99-09-2 3-Nitroaniline 22-25 U		1,1'-Biphenyl		
131-11-3 Dimethylphthalate 9 10 U 606-20-2 2,6-Dinitrotoluene 9 10 U 208-96-8 Acenaphthylene 9 10 U 99-09-2 3-Nitroaniline 22-25 U				Ŭ
606-20-2 2,6-Dinitrotoluene 910 U 208-96-8 Acenaphthylene 99-09-2 3-Nitroaniline 22-25 U				
208-96-8 Acenaphthylene 4 10 U 99-09-2 3-Nitroaniline 22-25 U				
99-09-2 3-Nitroaniline 22.25 U				
83-32-9 Acenaphthene 910 U			22 25	
	83-32-9	Acenaphthene	910	Ŭ

FORM I SV-1

Carikson OLMO4.2

1D

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Contract: OLM04-REVS

SW02PB

Lab Name: COMPUCHEM

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-3

Sample wt/vol:

1125 (g/mL) ML

Lab File ID: RX1067-3A70

Level:

(low/med)

LOW

Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Concentrated Extract Volume:

Date Extracted: 05/05/03

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

1000(uL)

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

			
51-28-5	2,4-Dinitrophenol	22 25	Ŭ
100-02-7	4-Nitrophenol	22 25	Ŭ
132-64-9	Dibenzofuran	9 30	Ü
121-14-2	2,4-Dinitrotoluene	9 +0	Ü
84-66-2	Diethylphthalate	0.4	J
86-73-7	Fluorene	9 10	Ü
7005-72-3	4-Chlorophenyl-phenylether	910	U
100-01-6	4-Nitroaniline	22 23 25	Ü
534-52-1	4,6-Dinitro-2-methylphenol	22-23 25	Ū
86-30-6	N-nitrosodiphenylamine (1)	9 10	U
101-55-3	4-Bromophenyl-phenylether	710	U
118-74-1	Hexachlorobenzene	/ 10	Ū
1912-24-9	Atrazine	9 10	Ü
87-86-5	Pentachlorophenol	22 25	Ū
85-01-8	Phenanthrene	910	Ū
120-12-7	Anthracene	10	Ū
86-74-8	Carbazole	10	Ū
84-74-2	Di-n-butylphthalate	9 0.4	JB 4
206-44-0	Fluoranthene	9 10	Ū
129-00-0	Pyrene	9' 10	Ū
85-68-7	Butylbenzylphthalate	904	JB /
91-94-1	3,3'-Dichlorobenzidine	, 10	U
56-55-3	Benzo(a) anthracene	1.0	Ū
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	1 10	Ū
117-84-0	Di-n-octylphthalate	10	Ū
205-99-2	Benzo(b)fluoranthene	10	Ū
207-08-9	Benzo(k)fluoranthene	1.0	Ū
50-32-8	Benzo(a)pyrene	1 10	Ū
193-39-5	Indeno(1,2,3-cd)pyrene	110	ប
53-70-3	Dibenzo(a,h)anthracene	10	Ū
191-24-2	Benzo(g,h,i)perylene	10	Ū

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

CO ENKSON 7/8/03 DLM04.2

TENTATIVELY IDENTIFIED COMPOUNDS SW02PB Contract: OLM04-REVS

Lab Name: COMPUCHEM

Case No.:

Lab Code: LIBRTY

SDG No.: RX1067 SAS No.:

EPA SAMPLE NO.

Lab Sample ID: RX1067-3 Matrix: (soil/water) WATER

(g/mL)Lab File ID: RX1067-3A70 Sample wt/vol: 1125 ML

Date Received: 05/01/03 Level: (low/med) LOW

Decanted: (Y/N) Date Extracted:05/05/03 % Moisture:

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

Extraction: (Type) CONT GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
$\left \frac{1}{2} \right $		 -		
3.	<u></u>			
4.				
5.				
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18. 19.	· · · · · · · · · · · · · · · · · · ·			
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28.				
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30.				

FORM I SV-TIC

Contract: OLM04-REVS

SW03PB

EPA SAMPLE NO.

Lab Code: LIBRTY

Lab Name: COMPUCHEM

Case No.:

SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-4

Sample wt/vol:

1100 (g/mL) ML Lab File ID: RX1067-4A70

Level:

(low/med) LOW

Date Received: 05/01/03

% Moisture:

decanted: (Y/N)____

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N pH: 7.0

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u> Q

100-52-7	Benzaldehyde	9 10	Ū
108-95-2	Phenol	, 10	ָ ט
111-44-4	bis(2-Chloroethyl)ether	10	Ū
95-57-8	2-Chlorophenol	10	Ū
95-48-7	2-Methylphenol	10	Ū
108-60-1	2,2'-oxybis(1-Chloropropane)	10	ט
98-86-2	Acetophenone	10	Ū
106-44-5	4-Methylphenol	10	Ū
621-64-7	N-Nitroso-di-n-propylamine	10	Ū
67-72-1	Hexachloroethane	10	Ū
98-95-3	Nitrobenzene	10	Ū
78-59-1	Isophorone	10	Ū
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	1.0	Ü
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	10	Ū
91-20-3	Naphthalene	1.0	Ü
106-47-8	4-Chloroaniline	10	Ū
87-68-3	Hexachlorobutadiene	10	Ū
105-60-2	Caprolactam	10	Ū
59-50-7	4-Chloro-3-methylphenol	20	Ū
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	VUI
88-06-2	2,4,6-Trichlorophenol	9 10	Ū
95 - 95-4	2,4,5-Trichlorophenol	23 25	Ü
92 - 52-4	1,1'-Biphenyl	9 10	U
91-58-7	2-Chloronaphthalene	910	Ŭ
88-74-4	2-Nitroaniline	23 25	Ū
131-11-3	Dimethylphthalate	9 10	U
606-20-2	2,6-Dinitrotoluene	910	U
208-96-8	Acenaphthylene	9 10	<u> </u>
99-09-2	3-Nitroaniline	23 25	Ü
83-32-9	Acenaphthene	910	Ü

FORM I SV-1

Carikson 7/8/03 OLM04.2

EPA SAMPLE NO.

SW03PB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

5W-6

Lab Code: LIBRTY Case No.: SAS No.:

SDG No.: RX1067

Matrix: (soil/water) WATER

Lab Sample ID: RX1067-4

Sample wt/vol:

1100 (g/mL) ML Lab File ID: RX1067-4A70

Level:

(low/med)

LOW

Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/08/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)N pH: 7.0

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

51-28-5	2,4-Dinitrophenol	23 25	Ū
100-02-7	4-Nitrophenol	23 25	Ū
132-64-9	Dibenzofuran	4 10	Ü
121-14-2	2,4-Dinitrotoluene	/10	Ū
84-66-2	Diethylphthalate) 10	Ū
86-73-7	Fluorene	140	Ū
7005-72-3	4-Chlorophenyl-phenylether	9 10	Ū
100-01-6	4-Nitroaniline	23 25	Ū
534-52-1	4,6-Dinitro-2-methylphenol	23 25	Ū
86-30-6	N-nitrosodiphenylamine (1)	9 19	Ū
101-55-3	4-Bromophenyl-phenylether	,10	Ū
118-74-1	Hexachlorobenzene	1-0	Ū
1912-24-9	Atrazine	10	Ū
87-86-5	Pentachlorophenol	13- 25	Ū
85-01 - 8	Phenanthrene	g 1 0	Ū
120-12-7	Anthracene	, 10	บ
86-74-8	Carbazole	12-0	Ū
84-74-2	Di-n-butylphthalate	10	Ū
206-44-0	Fluoranthene	1.0	Ū
129-00-0	Pyrene	1.0	Ū
85-68-7	Butylbenzylphthalate	1.0	ט
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a) anthracene	10	Ü
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	9 0.8	-3B U
117-84-0	Di-n-octylphthalate	, 10	ָ ט
205-99 - 2	Benzo(b) fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a) pyrene	10	Ü
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	Ŭ
191-24-2	Benzo(g,h,i)perylene	10	Ū
/7 1 /7-	MANAR DA GAMANARAN ENAM Dimbamilamina		

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

Contract: OLM04-REVS

SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-4

Case No.:

Sample wt/vol: 1100 (g/mL)Lab File ID: RX1067-4A70 ML

Date Received: 05/01/03 Level: (low/med) LOW

Date Extracted:05/05/03 Decanted: (Y/N)____ % Moisture:

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Dilution Factor: 1.0 Injection Volume: 2.0(uL)

Extraction: (Type) CONT GPC Cleanup: (Y/N)N pH: 7.0

> CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

EPA SAMPLE NO.

SW03PB

Number TICs found: 1

Lab Name: COMPUCHEM

Lab Code: LIBRTY

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	6.75	3	===== J
2.	OMMONIA	0.73		
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30.				

FORM I SV-TIC

OLMO4.2



DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

ORGANIC ANALYSIS DATA Semivolatiles in Water

SDG No. RZ1067 April 2003 Sample Collections

Chemical Analyses Performed by: CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 21, 2003



EXECUTIVE SUMMARY

Validation of the semivolatile organics analysis data prepared by CompuChem Environmental for nine water samples and one field blank (FB) from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RZ1067, which was received for review on July 8, 2003. The following samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8) GW09FBPB (Field Blank)	GW02PB (MB-9)	GW01PB (MB-10)

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for 2,4-dinitrophenol in GW03PB, GW04PB, GW05PB, and GW06PB were rejected (R).
- Results for hexachlorocyclopentadiene in all samples were qualified as estimated (UJ).
- Results for 2,4-dinitrophenol in GW09FBPB, GW07PB, GW08PB, GW08DPPB, GW01PB, and GW02PB were qualified as estimated (UJ).
- Results for di-n-butylphthalate in GW07PB, GW03PB, GW02PB, and GW09FBPB, for butylbenzylphthalate in GW07PB, GW02PB, and GW09FBPB, and for bis(2-ethylhexyl)phthalate in GW08DPPB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and GW01PB were qualified as less than the sample-specific contract required quantitation limit (CRQL).
- Results for caprolactam in GW03PB and GW05PB and for diethylphthalate in GW07PB, GW04PB, and GW02PB were qualified as less than the sample-specific CRQL (U).
- The result for the TIC at RT 6.77 minutes in GW08DPPB was rejected (R).
- Sample-specific CRQLs for GW02PB and GW07PB were adjusted by the validator as listed in Section X to reflect the effective concentration factors applicable because more than 1000 mL of each sample was extracted.
- The TIC reported at RT 4.94 in GW05PB was rejected (R).



- The TIC at RT 22.76 minutes in GW01PB was moved from Form I-TIC to the alkane narrative report.
- The tentative identification of the TIC peak at RT 9.09 minutes in GW06PB was changed to "unknown" (from ninhydrin), and the "N" qualifier applied by the laboratory was removed.
- The complete compound name for the TIC peak at 15.36 minutes in GW07PB was added to the Form I-TIC.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XIII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the semivolatiles data.



INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Organics Analyses OLM04.2. Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in conformance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev 12), "Evaluation of Organics Data for the CLP," (3/01) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

- U The material was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
- NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.



R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified, and the results are therefore unusable.

These codes are recorded on the customized data table contained in Attachment A and the Organic Analysis Data Sheets (Form Is) in Attachment B of this validation report to indicate qualifications placed on the data as a result of the review.

Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The samples were collected on 4/30/03. All samples were extracted on 5/5/03, which is within the established (seven days from collection) holding time. Analyses were performed on 5/9/03 and 5/12/03, well within the required holding time of 40 days from extraction. Therefore, both required holding times were met.

Acceptable (4°C \pm 2°C) cooler temperatures (2-6°C) on receipt at the laboratory were recorded on the COC record applicable to these samples. The same temperatures were also recorded on the applicable laboratory receiving logs.

Sampler notations on the COCs indicate that the samples for semivolatiles analysis were iced. The narrative in the data package further states that all samples were received intact and properly refrigerated.

II. GC/MS Instrument Performance Checks

Four decafluorotriphenylphosphine (DFTPP) instrument performance checks were run, representing every shift (12-hour period) during which samples or associated standards were analyzed. Results for all four instrument performance checks were acceptable.

III. Calibration

Analyses were performed on a single gas chromatograph/mass spectrometer (GC/MS) system identified as 5972HP70 (HP70). One or more target analytes required manual integration in all of the standards and many of the samples associated with this data set. Documentation of each integration performed by the laboratory was provided in the data package; all manual integrations were correctly performed and accurately transcribed to the applicable quantitation report.

Internal standard compound acenaphthene-d₁₀ was manually integrated in two initial calibration standards and surrogate compound phenol-d₅ was manually integrated in one initial calibration standard. These integrations were also fully documented and verified to be acceptable.

A. Initial Calibration (IC)

One IC (4/27/03) was performed in support of the reported sample analyses. Documentation of all individual IC standards analyzed was present in the data package and average relative response factor (RRF) as well as percent relative standard deviation (%RSD) values were correctly calculated and accurately reported. All average RRFs were above the minimum response criterion (0.05). All %RSDs were below the maximum acceptance criterion of 30% with the exception of 2,4-dinitrophenol (44.5%).



2,4-Dinitrophenol was not detected in any of the samples in this data set, and the %RSD did not significantly exceed the acceptance criterion (i.e., was not greater than 50%). Therefore, based on professional judgment, no action was taken as a result of the high %RSD value for this analyte.

B. Continuing Calibration (CC)

Sample and associated quality control analyses were performed under three CC standards. Documentation of all three CC standards was present in the data package, and RRF as well as percent difference (%D) values were correctly calculated and accurately reported in all cases.

All RRFs were above the 0.05 minimum criterion in the three CC standards with the exception of 2,4-dinitrophenol (0.036) in the 5/12/03 CC. Results for 2,4-dinitrophenol in GW03PB, GW04PB, GW05PB, and GW06PB were rejected (R) as unreliable on this basis.

The following %D values were above the maximum acceptance criterion (25%):

5/8/03-10:30: hexachlorocyclopentadiene - 56.6%

2,4-dinitrophenol - 42.9% pentachlorophenol - 26.0%

2,4,6-tribromophenol (surrogate) - 30.1%

5/9/03-09:59: hexachlorobutadiene - 36.4%

hexachlorocyclopentadiene - 76.9%

2,4-dinitrophenol - 59.1%

4,6-dinitro-2-methylphenol - 27.9%

pentachlorophenol - 30.3%

5/12/03-08:55: hexachlorocyclopentadiene - 60.2%

2,4-dinitrophenol - 76.6%
4-nitrophenol - 30.2%
4-nitroaniline - 34.1%
pentachlorophenol - 26.8%
indeno(1,2,3-cd)pyrene - 28.2%
dibenzo(a,h)anthracene - 25.8%

2,4,6-tribromophenol (surrogate) - 27.6%

Only the method blank was associated with the 5/8/03 CC standard. Therefore, no sample results required qualification based on the high %D values listed above for this standard.

All of the sample analyses were associated with the 5/9/03 and 5/12/03 CC standards. No positive results were reported for the affected target analytes in any of the samples. With the exception of 2,4-dinitrophenol in the 5/12/03 CC, the RRFs were all acceptable (i.e., were greater



than 0.05). For hexachlorobutadiene, 4,6-dinitro-2-methylphenol, and pentachlorophenol in the 5/9/03 CC and for 4-nitrophenol, 4-nitroaniline, pentachlorophenol, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and 2,4,6-tribromophenol (surrogate) in the 5/12/03 CC, the %Ds were not substantially above the acceptance criterion (i.e., were not greater than 50%). Results for hexachlorocyclopentadiene and 2,4-dinitrophenol in all site samples were qualified as estimated (UJ) based on the very high %D values (i.e., greater than 50%) for these analytes in the associated CC standards. No further action was warranted based on these CC standard results.

IV. Blanks

One laboratory method blank (MB: SBLKHC) was prepared and analyzed with the samples in this data set. Di-n-butylphthalate (0.3 μ g/L), butylbenzylphthalate (0.3 μ g/L), and bis(2-ethylhexyl)phthalate (0.8 μ g/L) were reported in this MB. Results for di-n-butylphthalate in GW07PB, GW03PB, GW02PB, and GW09FBPB, for butylbenzylphthalate in GW07PB, GW02PB, and GW09FBPB, and for bis(2-ethylhexyl)phthalate in GW08DPPB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and GW01PB were qualified as less than the sample-specific contract required quantitation limit (CRQL) based on the associated MB contamination.

No tentatively identified compounds were detected in the MB.

One field blank (GW09FBPB) was associated with this data set. After qualifications based on laboratory blank contamination, caprolactam (15 μ g/L) and diethylphthalate (0.3 μ g/L) were reported in GW09FBPB. Results for caprolactam in GW03PB and GW05PB and for diethylphthalate in GW07PB, GW04PB, and GW02PB were qualified as less than the sample-specific CRQL (U) based on the associated field blank contamination.

One tentatively identified compound was detected in the field blank; see Section XI for further discussion.

V. Surrogate Recoveries

Recoveries of the eight surrogate compounds in all site samples, spiked samples, and blanks were within the acceptance limits documented on the summary form with the exception of 2-chlorophenol (120%; QC 33-110%) in the matrix spike analysis of GW08PB. Since only one surrogate recovery was outside acceptance limits, and all surrogate recoveries were acceptable in the unspiked and matrix spike duplicate analysis of this sample, no action was warranted on this basis.



VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Sample GW08PB was prepared and analyzed as an MS/MSD pair. Percent recoveries and relative percent differences (RPDs) between paired recoveries were correctly calculated, accurately reported, and within the acceptance limits documented on Form 3 except for the recoveries of phenol (129%; QC 10-80%) and 2,4-dinitrotoluene (104%; QC 24-96%) in the MS and for 4-nitrophenol (129% and 103%; QC 10-80%) and pentachlorophenol (147% and 131%; QC 9-103%) in both spiked analyses. These high recoveries suggest the possibility of reporting false positives or detected results that are biased high. Since none of the affected analytes was detected in the unspiked sample, no action was taken on this basis.

No non-blank-related, unspiked target analytes were detected in GW08PB, the MS, or the MSD. Therefore, no further evaluation of precision could be made using these data.

VII. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. After qualifications based on associated blank contamination, no target analytes were reported in either sample. Therefore, no quantitative evaluation of precision could be made using these data.

No TICs were reported in GW08PB, but a TIC at 6.77 minutes was reported as an unknown in GW08DPPB. No peak area was found on the TIC summary page included in the data package, and an estimated concentration of " $0 \mu g/L$ " was reported by the laboratory. Visual inspection of the chromatogram for GW08PB did not reveal a peak present at or near RT 6.77 minutes. Due to the lack of available quantitative data as well as lack of confirmation in the field duplicate analyses, the result for the TIC at RT 6.77 minutes in GW08DPPB was rejected (R).

VIII. Internal Standard (IS) Performance

All IS areas and RTs were within the acceptance limits (>50% and <200% of the area responses in the associated CC standard and within ± 30 seconds, respectively) in all reported sample analyses.

IX. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the data package.



X. Compound Quantitation and Reported Detection Limits

Target compound concentrations were correctly calculated and accurately reported for all reported sample analyses, including adjustments for the extraction of slightly more or less than 1000 mL of all samples.

Adjustments were made by the laboratory to the CRQLs to reflect the dilution factors applicable when less than 1000 mL of sample was extracted, but were not made to reflect the concentration factors applicable when more than 1000 mL of the sample was extracted. Although lowering the CRQLs under these circumstances is not required by the SOW and reporting the routine CRQLs is not technically incorrect, this adjustment has been made by the laboratory on previous data sets generated for this project. Therefore, to maintain consistency with historical project data, CRQLs for the following samples were adjusted by the validator to reflect extraction of slightly larger sample volumes than specified by the SOW:

Sample ID	Laboratory- Reported CRQLs	Volume Extracted/ Concentration Factor	Validator- Adjusted CRQLs
GW02PB	10/25 μg/L	1050 mL/0.95	10/24 μg/L
GW07PB	10/25 μg/L	1050 mL/0.95	10/24 μg/L

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific CRQLs may be found on the laboratory-generated Form I for each sample (Attachment B) as well as on the data tables.

XL Tentatively Identified Compounds (TIC)

One to 30 TICs were reported in all but one of the site samples in this data set, several of which were reported as alkanes. No TICs were found in GW08PB. As previously discussed (Section VII), the TIC reported in GW08DPPB was rejected.

One TIC, at RT 4.94 minutes, was reported in the field blank (GW09FBPB). A comparable peak was also reported as a TIC in GW05PB. Based on the presence of this peak in the associated field blank, the TIC reported at RT 4.94 in GW05PB was rejected (R).

The following additional actions were taken by the validator with respect to the remaining reported TIC results:

 Based on the mass spectrum, the TIC at RT 22.76 minutes in GW01PB was moved from Form I-TIC to the alkane narrative report. A copy of the library search for this peak is included in Attachment C.



- Based on professional judgment, the tentative identification of the TIC peak at RT 9.09 minutes in GW06PB was changed to "unknown" (from ninhydrin), and the "N" qualifier applied by the laboratory was removed by the validator. A copy of the library search for this peak is included in Attachment C.
- The complete compound name for the TIC peak at 15.36 minutes in GW07PB was added to the Form I-TIC by the validator.

All reported TICs were appropriately qualified as "J" by the laboratory to emphasize that these are *estimated* concentrations. These "J" qualifiers were not removed by the validator. Where a specific compound was tentatively identified, the TIC was also flagged "N" by the laboratory. Except where noted above, these "N" qualifiers were also not removed by the validator.

The Form I-TIC for each sample, as reported by the laboratory and with qualifiers and corrections noted as described above, are included in Attachment B to this report.

XII. System Performance

The analytical system appears to have been working within method specifications at the time of these analyses, based on evaluation of the available raw data.

XIII. Documentation

The samples reported in SDG No. RZ1067 were recorded on three chain of custody (COC) records which were included in the data package. The following issues were noted:

- Copies of courier airbills were not included in the data package to document the shipment portion of the sample transfers. Airbill numbers, however, were documented on the COC records.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should <u>not</u> be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are <u>laboratory-initiated quality control</u>; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.



XIV. Overall Assessment

Sample results were determined to be valid as reported with the following exceptions:

- Results for 2,4-dinitrophenol in GW03PB, GW04PB, GW05PB, and GW06PB were rejected (R) based on an unacceptably low relative response factor in the associated continuing calibration standard. These results also warranted qualification as estimated based on an elevated percent difference value in the continuing calibration standard; the "R" qualifier takes precedence.
- Results for hexachlorocyclopentadiene in all samples were qualified as estimated (UJ) based on a very high %D value for this analyte in the associated CC standards.
- Results for 2,4-dinitrophenol in GW09FBPB, GW07PB, GW08PB, GW08DPPB,
 GW01PB, and GW02PB were qualified as estimated (UJ) based on a very high %D value for this analyte in the associated CC standard.
- Results for di-n-butylphthalate in GW07PB, GW03PB, GW02PB, and GW09FBPB, for butylbenzylphthalate in GW07PB, GW02PB, and GW09FBPB, and for bis(2-ethylhexyl)phthalate in GW08DPPB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and GW01PB were qualified as less than the sample-specific CRQL based on associated method blank contamination.
- Results for caprolactam in GW03PB and GW05PB and for diethylphthalate in GW07PB, GW04PB, and GW02PB were qualified as less than the sample-specific CRQL (U) based on associated field blank contamination.
- Due to the lack of available quantitative data as well as lack of confirmation in the field duplicate analyses, the result for the TIC at RT 6.77 minutes in GW08DPPB was rejected (R).
- To maintain consistency with historical project data, sample-specific CRQLs for GW02PB and GW07PB were adjusted by the validator as listed in Section X to reflect the effective concentration factors applicable because more than 1000 mL of each sample was extracted.
- Based on the presence of this peak in the associated field blank, the TIC reported at RT 4.94 in GW05PB was rejected (R).
- Based on the mass spectrum, the TIC at RT 22.76 minutes in GW01PB was moved from Form I-TIC to the alkane narrative report.



- Based on professional judgment, the tentative identification of the TIC peak at RT 9.09 minutes in GW06PB was changed to "unknown" (from ninhydrin), and the "N" qualifier applied by the laboratory was removed by the validator.
- The complete compound name for the TIC peak at 15.36 minutes in GW07PB was added to the Form I-TIC.

Documentation issues are discussed in Section XIII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the semivolatiles data.



ATTACHMENT A

DATA TABLES
SDG No. RZ1067
Semivolatiles in Water
Marion Bragg Landfill - April 2003

offection Point ample ID ab Sample No.	> >	MB-1 GW08PB RZ1067-3	MB-1D GW08DPPB RZ1067-4	MB-2 GW07PB RZ1067-2	MB-5 GW03PB RZ1067-7	MB-6 GW04PB RZ1067-8	MB-7 GW05PB RZ1067-9	MB-8 GW06PB RZ1067-10	MB-9 GW02P RZ1067-
offection Date.	 >	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03
ilution/Concentration Factor =	CROL	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95
enzaldehyde	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
henol	10	10 U	10 U	10 U	10 U	10 U	, 10 U	10 U	10
e(2-Chiorocthyl)ether	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	' 10
-Chiorophenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
-Methylphenol	10 10	10 U 10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 10
2'-oxybin(1-Chloropropane) cetophenone	10	10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U 10 U	10 U	10
Methylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
-Nitroso-di-n-propylamine	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
exachioroethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
itrobenzene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
ophorone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
Nitrophenoi	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
4-Dimetrylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
a(2-Chloroethoxy)methane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
4-Dichlorophenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
aphthalene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
Chloroaniline	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
exachlorobutadiene aprolactam	10 10	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 10
Chloro-3-methylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
Methylnaphthalene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
exachlorocyclopentadiene	10	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10
4,6-Trichlorophenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
4,5-Trichiorophenol	25	25 U	25 U	24 U	25 U	25 U.	25 U	25 U	2
1'-Biphonyl	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
Nitroeniline	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	24
imethylphihalate	10	10 U	10 U	10 U	10 U	10 U	10 U	,10 U	10
6-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
cenaphthylene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
Nitromiline censolithene	25 10	25 U 10 U	25 U 10 U	24 U 10 U	25 U 10 U	25 U	25 U	25 U	24
4-Dinitrophenol	25	25 UJ	25 UJ	24 UJ	R	10 U R	10 U R	10 Uʻ R	10 24
Nitrophenol	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	2.
benzofuran	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
4-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
icthylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
worene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
Chlorophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
Nitroaniline	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	2
6-Dinitro-2-methylphenol	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	2
-nitrosodiphenylamine	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
-Bromophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
exachlorobenzene trazine	10 10	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 10
arazue entachlorophenol	25	25 U	25 U	10 U 24 U	25 U	10 U 25 U	25 U	10 U 25 U	2
henanthrene	10	10 U	10 U	10 U	10 U	23 U 10 U	10 U	10 U	10
nthracene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
arbazolo	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
i-n-butylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1
oranthene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	ì
TCDC	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
nylbenzylphthziate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
3'-Dichlorobenzidine	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1
enzo(a)anthracene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
hrysene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
o(2-Ethylhexyl)phthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	14
i-n-octylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1
enzo(b)fluoranthene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
enzo(k)fluoranthene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10
enzo(a)pyrene ideno(1,2,3-cd)pyrene	10 10	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U	10 U	10
ideno(1,2,3-cd)pyrene iiben20(a,h)anthracene	10 10	10 U	10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 10
	10	10 0	10 0	10 0	10 0	10 0	10 U	10.0	10

Results are in ug/L Collection Point	 >	MB-10	Field Blank
Sample ID	 >	GW01PB	GW09FBPB
Lan outsper 110.	 >	RZ1067-5	RZ1067-1
Collection Date. Dilution/Concentration Factor ==	-	4/30/03 1.08	4/30/03 1.08
Deuton Concess and Factor -	CROL	1.00	1.05
Benzaldehyde	10	11 U	11 U
Phenol	10	11 U	11 U
bin(2-Chloroethyl)ether	10	11 U	11 U
2-Chlorophenol	10	11 U	11 U
2-Methylphenol	10	11 U	11 U
2,2'-oxybin(1-Chloropropane)	10	11 U	11 U
Acetophenone	10	0.6 J	11 U
4-Methylphenol N-Nitroso-di-a-propylamine	10 10	11 U 11 U	11 U 11 U
Hexachloroethane	10	11 U	11 U
Nitrobenzene	10	11 U	11 U
Isophorone	10	11 U	11 U
2-Nitrophenol	10	11 U	11 U
2,4-Dimetrylphenol	10	11 U	11 U
bis(2-Chloroethoxy)methane	10	11 U	11 U
2,4-Dichlorophenol	10	11 U	11 U
Naphthalene	10	2 J 11 U	11 U
4-Chloromiline Hexachlorobutadiene	10 10	11 U	11 U 11 U
Caprolaction	10	11 U	15
4-Chloro-3-methylphenol	10	11 U	ii U
2-Methylnaphthalene	10	11 U	11 U
Hexachlorocyclopentadiene	10	11 UJ	11 UJ
2,4,6-Trichlorophenol	10	11 U	11 U
2,4,5-Trichlorophenol	25	27 U	27 U
1,1'-Biphenyl	10 10	0.4 J 11 U	11 U 11 U
2-Chloronaphthalene 2-Nitroaniline	25	27 U	27 U
Dimothylphthalate	10	11 U	11 U
2,6-Dinitrotoluene	10	11 U	11 U
Acenaphthylene	10	11 U	11 U
3-Nitroaniline	25	27 U	27 U
Acenaphthene	10	11 U	11 U
2,4-Dinitrophenol	25	11 03	27 UJ
4-Nitrophenol Dibenzofuran	25 10	11 U 11 U	27 U 11 U
2,4-Dinitrotoluene	10	11 U	11 U
Diethylphthalate	10	11 U	0.3 J
Fluorene	10	11 U	11 U
4-Chlorophenyl-phenylether	10	11 U	11 U
4-Nitroaniline	25	27 U	27 U
4.6-Dinitro-2-methylphenol	25 10	27 U 11 U	27 U
N-nitrosodiphenylamine 4-Bromophenyl-phenylether	10	11 U	11 U 11 U
Hexachlorobenzene	10	11 U	11 U
Atrazine	10	11 U	11 U
Pentachiorophenol	25	27 U	27 U
Phonanthrone	10	0.3 J	11 U
Anthracene	10	11 U	11 U
Carbazole Di a besteletetete	10 10	11 U 11 U	11 U
Di-n-butylphthalate Finoranthene	10	11 U	11 U 11 U
Pyrene	10	11 U	11 U
Butylbenzylphthalate	10	11 U	11 U
3,3'-Dichlorobenzidine	10	11 U	11 U
Benzo(a)anthracene	10	11 U	11 U
Chrysene	10	11 U	II U
bin(2-Ethylhexyl)phthalate	10	11 U	11 U
Di-n-octylphthalate	10	11 U	11 U
Benzo(b)fluoranthene Benzo(k)fluoranthene	10 10	11 U 11 U	11 U 11 U
Benzo(a)pyrene	10	11 U	11 U
Indeno(1,2,3-cd)pyrene	10	11 U	11 U
Dibenzo(a,h)anthracene	10	11 U	11 U
Benzo(g,h,i)perylene	10	ii U	ii U
ADM-1-18 Januar			•••

SAS No.:

EPA SAMPLE NO.

GW08PB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

MB-I

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-3

'Sample wt/vol:

Lab Code: LIBRTY

1000 (g/mL) ML

Lab File ID: RZ1067-3A70

Level:

(low/med) LOW

Date Received: 05/01/03

% Moisture:

N

decanted: (Y/N)

Case No.:

Date Extracted: 05/05/03

Concentrated Extract Volume:

Date Analyzed: 05/09/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)

pH: 6.0

1000 (uL)

Extraction:

(Type)

CONT

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

100-52-7	Benzaldehyde	10	Ü
108-95-2	Phenol	10	Ü
111-44-4	bis(2-Chloroethyl)ether	10	Ū
95-57-8	2-Chlorophenol	10	Ū
95-48-7	2-Methylphenol	10	Ü
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
98-86-2	Acetophenone	10	Ü
106-44-5	4-Methylphenol	10	Ü
621-64-7	N-Nitroso-di-n-propylamine	10	Ü
67-72-1	Hexachloroethane	10	Ū
98-95-3	Nitrobenzene	10	Ü
78-59-1	Isophorone	10	Ŭ ·
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	Ū
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	10	Ū
91-20-3	Naphthalene	10	Ū
106-47-8	4-Chloroaniline	10	Ū
87-68-3	Hexachlorobutadiene	10	Ū
105-60-2	Caprolactam	10_	Ü
59-50-7	4-Chloro-3-methylphenol	10	Ū
91-57-6	2-Methylnaphthalene	10_	Ŭ
77-47-4	Hexachlorocyclopentadiene	10	VUJ
88-06-2	2,4,6-Trichlorophenol	10	U (04)
95-95-4	2,4,5-Trichlorophenol	25	
92-52-4	1,1'-Biphenyl	10	O •
91-58-7	2-Chloronaphthalene	10	Ü
88-74-4	2-Nitroaniline	25	Ū
131-11-3	Dimethylphthalate	10	Ū
606-20-2	2,6-Dinitrotoluene	10	Ŭ
208-96-8	Acenaphthylene	10	Ü
99-09-2	3-Nitroaniline	25	Ü
83-32-9	Acenaphthene	10	Ŭ

FORM I SV-1

1D

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: COMPUCHEM Contract: OLM04-REVS

GW08PB MB-1

Lab Code: LIBRTY - Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-3

Sample wt/vol:

Lab File ID: RZ1067-3A70

Level:

(low/med)

1000 (g/mL) ML

Date Received: 05/01/03

% Moisture:

LOW

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/09/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 6.0

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

51-28-5	2,4-Dinitrophenol	25	LNA
100-02-7	4-Nitrophenol	25	
132-64-9	Dibenzofuran	10	U GAS
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	Ū
86-73-7	Fluorene	10	ט
7005-72-3	4-Chlorophenyl-phenylether	. 10	Ū
100-01-6	4-Nitroaniline	25	ט
534-52-1	4,6-Dinitro-2-methylphenol	25	Ū
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	Ū
118-74-1	Hexachlorobenzene	. 10	ט
1912-24-9	Atrazine	10	Ü
87-86-5	Pentachlorophenol	25	Ū
85-01-8	Phenanthrene	10	บ
120-12-7	Anthracene	10	Ū
86-74-8	Carbazole	10	Ū
84-74-2	Di-n-butylphthalate	10	Ū
206-44-0	Fluoranthene	10	Ū
129-00-0	Pyrene	10	Ū
85-68-7	Butylbenzylphthalate	10	Ū
91-94-1	3,3'-Dichlorobenzidine	10	Ū
56-55-3	Benzo(a) anthracene	10	Ū
218-01-9	Chrysene	10	Ū
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	Ū
205-99-2	Benzo(b)fluoranthene	10	Ū
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	<u> </u>
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	Ū
191-24-2	Benzo(g,h,i)perylene	10	Ū
(1) - Ca	nnot be separated from Diphenylamine		

FORM I SV-2

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM

Contract: OLM04-REVS

GW08PB MB-1

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-3

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: RZ1067-3A70

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: ____ Decanted: (Y/N) ___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 05/09/03

Injection Volume: 2.0(uL)

Number TICs found: 0

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

Extraction: (Type) CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER COMPOUND NAME RT EST. CONC. Q -----------------4. <u>6.</u> 8. 9. 10. 11. 12. 13. 14. 15. <u>16.</u> 17. 18. <u> 19.</u> 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30.

FORM I SV-TIC

EPA SAMPLE NO.

GW08DPPB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

MB-ID

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-4

Sample wt/vol:

1000 (g/mL) ML

Lab File ID: RZ1067-4A70

Level:

(low/med) LOW

Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/09/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

Extraction: (Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L Q

100-52-7 Benzaldehyde				
111-44-4 bis (2-Chloroethyl) ether			10	
95-57-8 2-Chlorophenol 10 U 95-48-7 2-Methylphenol 10 U U 108-60-1 2,2'-oxybis(1-Chloropropane) 10 U 10 U 10 10 U 10 10	108-95-2		10	
95-57-8 2-Chlorophenol 10 U 95-48-7 2-Methylphenol 10 U 108-60-1 2,2'-oxybis (1-Chloropropane) 10 U 98-86-2 Acetophenone 10 U 106-44-5 4-Methylphenol 10 U 67-72-1 Hexachloroethane 10 U 98-95-3 Nitrobenzene 10 U 98-95-3 Nitrobenzene 10 U 105-67-9 2,4-Dimethylphenol 10 U 105-67-9 2,4-Dimethylphenol 10 U 111-91-1 bis (2-Chloroethoxy) methane 10 U 120-83-2 2,4-Dichlorophenol 10 U 106-47-8 4-Chloroaniline 10 U 105-60-2 Caprolactam 10 U 1		bis(2-Chloroethyl)ether	10	
95-48-7 2-Methylphenol 10 U 108-60-1 2,2'-oxybis(1-Chloropropane) 10 U 108-60-1 2,2'-oxybis(1-Chloropropane) 10 U 106-44-5 Acetophenone 10 U 106-44-5 4-Methylphenol 10 U 621-64-7 N-Nitroso-di-n-propylamine 10 U 67-72-1 Hexachloroethane 10 U 98-95-3 Nitrobenzene 10 U 78-59-1 Isophorone 10 U 78-59-1 Isophorone 10 U 10 10 10 10 10 10	95-57-8	2-Chlorophenol	10	
98-86-2 Acetophenone 10 U 106-44-5 4-Methylphenol 10 U 0 0 0 0 0 0 0 0	95-48-7	2-Methylphenol	10	Ü
98-86-2 Acetophenone 10 U 106-44-5 4-Methylphenol 10 U 0 0 0 0 0 0 0 0	108-60-1	2,2'-oxybis(1-Chloropropane)	10	
106-44-5	98-86-2		10	
10 U 10 10 10 10 10 10 1		4-Methylphenol	10	Ū
67-72-1 Hexachloroethane 10 U 98-95-3 Nitrobenzene 10 U 78-59-1 Isophorone 10 U 10 U 105-67-9 2,4-Dimethylphenol 10 U 111-91-1 Dis(2-Chloroethoxy)methane 10 U 120-83-2 2,4-Dichlorophenol 10 U 120-83-2 2,4-Dichlorophenol 10 U 105-67-9 Naphthalene 10 U 100-47-8 4-Chloroaniline 10 U 100-47-8 4-Chloroaniline 10 U 105-60-2 Caprolactam 10 U 10 10 10 10 10 10	621-64-7	N-Nitroso-di-n-propylamine	10	U
98-95-3 Nitrobenzene 10 U 78-59-1 Isophorone 10 U 10 U 10 10 U 10 10		Hexachloroethane	10	U
78-59-1 Isophorone	98-95-3		10	Ū
88-75-5 2-Nitrophenol 10 U 105-67-9 2,4-Dimethylphenol 10 U 111-91-1 bis (2-Chloroethoxy) methane 10 U 120-83-2 2,4-Dichlorophenol 10 U 106-47-8 4-Chloroaniline 10 U 105-60-2 Caprolactam 10 U 105-60-2 Caprolactam 10 U 105-60-2 Caprolactam 10 U 10 10 10 10 10 10		Isophorone	10	Ū
105-67-9			10	Ū
111-91-1 bis (2-Chloroethoxy) methane 10 U 120-83-2 2,4-Dichlorophenol 10 U 91-20-3 Naphthalene 10 U 106-47-8 4-Chloroaniline 10 U 87-68-3 Hexachlorobutadiene 10 U 105-60-2 Caprolactam 10 U 59-50-7 4-Chloro-3-methylphenol 10 U 91-57-6 2-Methylnaphthalene 10 U 88-06-2 2,4,6-Trichlorophenol 10 U 95-95-4 2,4,5-Trichlorophenol 25 U 92-52-4 1,1'-Biphenyl 10 U 91-58-7 2-Chloronaphthalene 10 U 88-74-4 2-Nitroaniline 25 U 131-11-3 Dimethylphthalate 10 U 606-20-2 2,6-Dinitrotoluene 10 U 208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U	105-67-9	2,4-Dimethylphenol	10	U
120-83-2	111-91-1	bis(2-Chloroethoxy)methane	10	
91-20-3 Naphthalene 10 U 106-47-8 4-Chloroaniline 10 U 105-68-3 Hexachlorobutadiene 10 U 105-60-2 Caprolactam 10 U 10 U 10 U 10 U 10 U 10 U 10	120-83-2	2,4-Dichlorophenol	10	U
87-68-3 Hexachlorobutadiene 10 U 105-60-2 Caprolactam 10 U 59-50-7 4-Chloro-3-methylphenol 10 U 91-57-6 2-Methylnaphthalene 10 U 77-47-4 Hexachlorocyclopentadiene 10 U 88-06-2 2,4,6-Trichlorophenol 10 U 95-95-4 2,4,5-Trichlorophenol 25 U 92-52-4 1,1'-Biphenyl 10 U 91-58-7 2-Chloronaphthalene 10 U 88-74-4 2-Nitroaniline 25 U 131-11-3 Dimethylphthalate 10 U 606-20-2 2,6-Dinitrotoluene 10 U 208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U	91-20-3	Naphthalene	10	Ū
105-60-2 Caprolactam 10 U	106-47-8	4-Chloroaniline	10	Ū
59-50-7 4-Chloro-3-methylphenol	87-68-3	Hexachlorobutadiene	10	Ū
91-57-6 2-Methylnaphthalene 10 U 77-47-4 Hexachlorocyclopentadiene 10 U 88-06-2 2,4,6-Trichlorophenol 10 U 95-95-4 2,4,5-Trichlorophenol 25 U 92-52-4 1,1'-Biphenyl 10 U 91-58-7 2-Chloronaphthalene 10 U 88-74-4 2-Nitroaniline 25 U 131-11-3 Dimethylphthalate 10 U 606-20-2 2,6-Dinitrotoluene 10 U 208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U	105-60-2		10	
77-47-4 Hexachlorocyclopentadiene 10 U 88-06-2 2,4,6-Trichlorophenol 10 U 95-95-4 2,4,5-Trichlorophenol 25 U 92-52-4 1,1'-Biphenyl 10 U 91-58-7 2-Chloronaphthalene 10 U 88-74-4 2-Nitroaniline 25 U 131-11-3 Dimethylphthalate 10 U 606-20-2 2,6-Dinitrotoluene 10 U 208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U			10	
88-06-2 2,4,6-Trichlorophenol 10 U 95-95-4 2,4,5-Trichlorophenol 25 U 92-52-4 1,1'-Biphenyl 10 U 91-58-7 2-Chloronaphthalene 10 U 88-74-4 2-Nitroaniline 25 U 131-11-3 Dimethylphthalate 10 U 606-20-2 2,6-Dinitrotoluene 10 U 208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U		2-Methylnaphthalene	10	
88-06-2 2,4,6-Trichlorophenol		Hexachlorocyclopentadiene		V U.T
92-52-4 1,1'-Biphenyl 10 U		2,4,6-Trichlorophenol		
91-58-7 2-Chloronaphthalene 10 U 88-74-4 2-Nitroaniline 25 U 131-11-3 Dimethylphthalate 10 U 606-20-2 2,6-Dinitrotoluene 10 U 208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U		2,4,5-Trichlorophenol		UCOL
91-58-7 2-Chloronaphthalene 10 U 88-74-4 2-Nitroaniline 25 U 131-11-3 Dimethylphthalate 10 U 606-20-2 2,6-Dinitrotoluene 10 U 208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U			10	טויכונ ט
131-11-3 Dimethylphthalate 10 U 606-20-2 2,6-Dinitrotoluene 10 U 208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U		2-Chloronaphthalene		Ū
606-20-2 2,6-Dinitrotoluene 10 U 208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U				
208-96-8 Acenaphthylene 10 U 99-09-2 3-Nitroaniline 25 U		Dimethylphthalate	10	
99-09-2 3-Nitroaniline 25 U			10	
83-32-9 Acenaphthene			25	
	83-32-9	Acenaphthene	10	Ū

FORM I SV-1

EPA SAMPLE NO.

GW08DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

MB-1D

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-4

Sample wt/vol:

1000 (g/mL) ML

Lab File ID: RZ1067-4A70

Level:

(low/med)

LOW

Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/09/03

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

Extraction:

(Type) CONT

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

51-28-5	2,4-Dinitrophenol	25	U/11	II.
100-02-7	4-Nitrophenol	25	77	
132-64-9	Dibenzofuran	10	Ū	COL
121-14-2	2,4-Dinitrotoluene	10	Ū	<u>, 1812,</u>
84-66-2	Diethylphthalate	10	Ū	
86-73-7	Fluorene	10	Ū	 }
7005-72-3	4-Chlorophenyl-phenylether	10	Ū	
100-01-6	4-Nitroaniline	25	Ū	
534-52-1	4,6-Dinitro-2-methylphenol	25	Ū	
86-30-6	N-nitrosodiphenylamine (1)	.10	Ū	
101-55-3	4-Bromophenyl-phenylether	10	Ū	
118-74-1	Hexachlorobenzene	10	Ū	
1912-24-9	Atrazine	10	Ū	
87-86-5	Pentachlorophenol	25	Ū	
85-01-8	Phenanthrene	10	Ū	
120-12-7	Anthracene	10	Ū	
86-74-8	Carbazole	10	Ū	
84-74-2	Di-n-butylphthalate	10	Ū	
206-44-0	Fluoranthene	10	Ū	
129-00-0	Pyrene	10	บ	
85-68-7	Butylbenzylphthalate	10	Ü	
91-94-1	3,3'-Dichlorobenzidine	10	Ū	
56-55-3	Benzo(a) anthracene	10	Ū	
218-01-9	Chrysene	10	Ū	
117-81-7	bis(2-Ethylhexyl)phthalate	10 X	JE	U
117-84-0	Di-n-octylphthalate	10	Ū	
205-99-2	Benzo(b)fluoranthene	10	U	COL
207-08-9	Benzo(k)fluoranthene	10	Ū	12
50-32-8	Benzo(a) pyrene	10	Ū	- 40
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	- 46
53-70-3	Dibenzo(a,h)anthracene	10	U	
191-24-2	Benzo(g,h,i)perylene	10	Ū	

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

SAS No.:

TENTATIVELY IDENTIFIED COMPOUNDS

Contract: OLM04-REVS

GW08DPPB MB-ID

SDG No.: RZ1067

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Lab Code: LIBRTY Case No.:

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-4

Sample wt/vol: 1000 (g/mL) Lab File ID: RZ1067-4A70 ML

Level: (low/med) LOW Date Received: 05/01/03

Decanted: (Y/N)____ Date Extracted: 05/05/03 % Moisture:

Concentrated Extract Volume: Date Analyzed: 05/09/03 1000 (uL)

Injection Volume: Dilution Factor: 1.0 2.0(uL)

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	· · · · · · · · · · · · · · · · · · ·	RT	EST. CONC.	Q =77==
1	UNKNOWN	6.77		K
2.			MAGNIKSON	2/21/0
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4.				
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9.				
10.		-		
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24.				
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29.				
30.				

FORM I SV-TIC

EPA SAMPLE NO.

GW07PB MB-> Contract: OLM04-REVS

Lab Name: COMPUCHEM

SDG No.: RZ1067

Lab Code: LIBRTY

Case No.:

SAS No.:

Lab Sample ID: RZ1067-2

Matrix: (soil/water) WATER Sample wt/vol:

Lab File ID: RZ1067-2A70

Level:

(low/med)

1050 (g/mL) ML

Date Received: 05/01/03

% Moisture:

FOM

N

decanted: (Y/N)___

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/09/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N)

pH: 7.0

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

			_
100-52-7	Benzaldehyde	10	U_
108-95-2	Phenol	10	Ū
111-44-4	bis(2-Chloroethyl)ether	10	Ū
95-57-8	2-Chlorophenol	10	Ū
95-48-7	2-Methylphenol	10	Ū
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
98-86-2	Acetophenone	10	Ū
106-44-5	4-Methylphenol	10	Ū
621-64-7	N-Nitroso-di-n-propylamine	10	Ū
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	<u> </u>
78-59-1	Isophorone	10	บ
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	Ū
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	1.0	Ū
91-20-3	Naphthalene	10	Ū
106-47-8	4-Chloroaniline	10_	Ū
87-68-3	Hexachlorobutadiene	10	Ū
105-60-2	Caprolactam	10	Ū
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	Ū_
77-47-4	Hexachlorocyclopentadiene	10	VUJ
88-06-2	2,4,6-Trichlorophenol	3 10	U MAY
95-95-4	2,4,5-Trichlorophenol	2428	<u>U</u> 714
92-52-4	1,1'-Biphenyl	10	U .
91-58-7	2-Chloronaphthalene	10	Ū
88-74-4	2-Nitroaniline	2425	Ŭ
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	3 10	Ū
208-96-8	Acenaphthylene	3 10	Ū
99-09 - 2	3-Nitroaniline	8 24 25	U
83-32-9	Acenaphthene	10	Ü

FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW07PB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-2 Lab File ID: RZ1067-2A70

Sample wt/vol:

Level: (low/med) LOW

1050 (g/mL) ML

Date Received: 05/01/03

% Moisture:

Date Extracted: 05/05/03

___ decanted: (Y/N) ___

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 05/09/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>

			7717
51-28-5	2,4-Dinitrophenol	24 25	L <i>P</i>
100-02-7	4-Nitrophenol	2428	U
132-64-9	Dibenzofuran	10	Ū
121-14-2	2,4-Dinitrotoluene	10	Ū
84-66-2	Diethylphthalate	10 0.5	JF U
86-73-7	Fluorene	10	Ü
7005-72-3	4-Chlorophenyl-phenylether	10	Ü
100-01-6	4-Nitroaniline	24 28	Ū
534-52-1	4,6-Dinitro-2-methylphenol	24 25	ט`
86-30-6	N-nitrosodiphenylamine (1)	10	Ū,
101-55 - 3	4-Bromophenyl-phenylether	10	Ū
118-74-1	Hexachlorobenzene	10	U -
1912-24-9	Atrazine	10	Ü
87-86-5	Pentachlorophenol	2423	Ü
85-01-8	Phenanthrene	10	Ü
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	Ü
84-74-2	Di-n-butylphthalate	10 00	JB U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	Ŭ
85-68-7	Butylbenzylphthalate	10 25	JB U
91-94-1	3,3'-Dichlorobenzidine	10	Ü
56-55-3	Benzo(a)anthracene	10	Ū
218-01-9	Chrysene	10	Ū
117-81-7	bis(2-Ethylhexyl)phthalate	10	Ū
117-84-0	Di-n-octylphthalate	1.0	Ü
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	Ü
50-32-8	Benzo(a) pyrene	10	Ŭ
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	Ŭ
191-24-2	Benzo(g,h,i)perylene	10	Ŭ
$(1) - C_{i}$	annot be separated from Diphenylamine		

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

EPA SAMPLE NO. SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

GW07PB MB-2

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-2

Sample wt/vol: 1050 (g/mL)

Lab File ID: RZ1067-2A70

Level: (low/med)

LOW

Date Received: 05/01/03

% Moisture: ____ Decanted: (Y/N)___

Date Extracted:05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/09/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type) CONT

CONCENTRATION UNITS:

Number TICs found: 8 (ug/L or ug/Kg) UG/L

l	······································	T	 	
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
				=====
$\left \begin{array}{c} 1 \\ \hline 2 \end{array} \right $	UNKNOWN	5.68	2 2	J
		6.74 8.82	4	J, NJ
3585-34-2-	PHENOL, M-TERT-BUTYL- (1/20 MOR)	9.39		J
<u>4.</u> 5.	UNKNOWN		. 2	5
6. 115-28-6	BICYCLO[2.2.1]HEPT-5-ENE-2,3-	14.91 才 15.36	87	NJ
7. 10544-50-0	SULFUR, MOL. (S8)	15.87		NJ
8.	UNKNOWN	16.40	. 29	J
9.	ONRIONIA .	10.40	0	<u> </u>
10.			·	
11.		<u> </u>		
12.				
13.				
14.				
15.	* dicarbox 41'c acid, 1,4,5,6,7,7	- hexachlon	-	
16.	3	TO PER PROPERTY		
17.				
18.	Mil	1K400 71	21/03	
19.		1111111111	· / · · · · · · · · · · · · · · · · · ·	
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30.				

FORM I SV-TIC

Case No.:

Lab Code: LIBRTY

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Contract: OLM04-REVS

SDG No.: RZ1067

GW03PB

EPA SAMPLE NO.

MB-5 Lab Name: COMPUCHEM

SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-7

Sample wt/vol: 500 Lab File ID: RZ1067-7A70 (g/mL) ML

Level: (low/med) Date Received: 05/01/03 LOW

Date Extracted: 05/05/03 decanted: (Y/N) % Moisture:

Concentrated Extract Volume: 500(uL) Date Analyzed: 05/12/03

Injection Volume: Dilution Factor: 1.0 2.0(uL)

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CONCENTRATION UNITS: CAS NO. COMPOUND (uq/L or ug/Kg) UG/L Q

CAD NO.	301. G 01. B	(ug/L or ug/kg/ o	<u> </u>
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	Ū
111-44-4	bis(2-Chloroethyl)ether	10	ו
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	Ū
108-60-1	2,2'-oxybis(1-Chloropropane)	10	<u> </u>
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	Ū
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	<u> </u>
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	D W
87-68-3	Hexachlorobutadiene	10	U O
105-60-2	Caprolactam	102	JUS
59-50-7	4-Chloro-3-methylphenol	10	1 0 12
91-57-6	2-Methylnaphthalene	10	Ū
77-47-4	Hexachlorocyclopentadiene	10	WINK
88-06-2	2,4,6-Trichlorophenol	10	U S
95-95-4	2,4,5-Trichlorophenol	25	1 0 1
92-52-4	1,1'-Biphenyl	10	Ü
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	Ü
131-11-3	Dimethylphthalate	10	Ŭ
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	ט
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

FORM I SV-1

1D

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Contract: OLM04-REVS Lab Name: COMPUCHEM

GW03PB

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-7

Sample wt/vol:

500

(g/mL) ML

Lab File ID: RZ1067-7A70

Level:

(low/med) LOW Date Received: 05/01/03

% Moisture:

____ decanted: (Y/N)___

Date Extracted: 05/05/03

Concentrated Extract Volume:

500 (uL)

Date Analyzed: 05/12/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type)

CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	(ug/L or ug/Kg) U	
51-28-5	2,4-Dinitrophenol	R 25	w w
100-02-7	4-Nitrophenol	25	U 3
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U T
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	Ū
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	. 10	Ū
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U S
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10 0.3	JBU
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a) anthracene	10	U X
218-01-9	Chrysene	10	0 7
117-81-7	bis(2-Ethylhexyl)phthalate	10 1	TR 173
117-84-0	Di-n-octylphthalate	10	
205-99-2	Benzo(b) fluoranthene	10	U S
207-08-9	Benzo(k)fluoranthene	10	Ü
50-32-8	Benzo(a)pyrene	10	Ū
193-39-5	Indeno(1,2,3-cd)pyrene	10	Ū
53-70-3	Dibenzo(a,h)anthracene	10	Ū
191-24-2	Benzo(g,h,i)perylene	10	Ū

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

GW03PB MB-5 Contract: OLM04-REVS

SDG No.: RZ1067 Lab Code: LIBRTY Case No.: SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-7

Sample wt/vol: 500 (g/mL) Lab File ID: RZ1067-7A70 ML

Date Received: 05/01/03 Level: (low/med) LOW

% Moisture: ____ Decanted: (Y/N) Date Extracted:05/05/03

Concentrated Extract Volume: 500(uL) Date Analyzed: 05/12/03

Dilution Factor: 1.0 Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

> CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 4

Lab Name: COMPUCHEM

·				
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	6.75	5	J
2.	UNKNOWN	14.91		J
3.	UNKNOWN	15.36	28	J
4. 10544-50-0	SULFUR, MOL. (S8)	15.88	42	NJ
5.				
6.				
7.				
8.				
9.				
10.				
12.				
13.				
14.			, <u>-</u>	
14. 15.	· · · · · · · · · · · · · · · · · · ·			
16.				
17.				
18.				
19.				
20. 21.				
$\frac{21.}{22.}$				
22.				
23. 24.				
25				
25. 26.	·		·	
27.				
28.				
29.				
30.				

FORM I SV-TIC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW04PB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

MB-6

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-8

Sample wt/vol:

1000 (g/mL) ML Lab File ID: RZ1067-8A70

Level:

(low/med)

Date Received: 05/01/03

% Moisture:

_____decanted: (Y/N)____

LOW

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/12/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

CONT

GPC Cleanup:

(Y/N) N

pH: 7.0

Extraction:

(Type)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

100 60 7	Donneldehade	10	
100-52-7	Benzaldehyde	10	U U
108-95-2	Phenol	10	<u> </u>
111-44-4	bis(2-Chloroethyl)ether	10	
95-57-8	2-Chlorophenol	1.0	Ü
95-48-7	2-Methylphenol	10	ט
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ü
98-86-2	Acetophenone	. 10	Ü
106-44-5	4-Methylphenol	10	Ü
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	.10	Ū
98-95-3	Nitrobenzene	10	Ŭ
78-59-1	Isophorone	10	Ū
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	Ū
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	Ū
106-47-8	4-Chloroaniline	10	Ū
87-68-3	Hexachlorobutadiene	10	Ū
105-60-2	Caprolactam	10	Ū
59-50-7	4-Chloro-3-methylphenol	10	Ū
91-57-6	2-Methylnaphthalene	10	U.
77-47-4	Hexachlorocyclopentadiene	10	BUJ
88-06-2	2,4,6-Trichlorophenol	10	777
95-95-4	2,4,5-Trichlorophenol	25	U cas
92-52-4	1,1'-Biphenyl	10	5 7/21 9
91-58-7	2-Chloronaphthalene	10	Ū
88-74-4	2-Nitroaniline	25	Ū
131-11-3	Dimethylphthalate	10	Ū
606-20-2	2,6-Dinitrotoluene	10	Ü
208-96-8	Acenaphthylene	10	Ū
99-09-2	3-Nitroaniline	25	Ū
83-32-9	Acenaphthene	10	U —

FORM I SV-1

1D

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Contract: OLM04-REVS

GW04PB MB-6

Lab Code: LIBRTY

Lab Name: COMPUCHEM

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-8

Sample wt/vol:

1000

LOW

Lab File ID: RZ1067-8A70

Level:

(low/med)

(g/mL) ML

Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

2.0(uL)

Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 05/12/03

Dilution Factor: 1.0

Injection Volume:

GPC Cleanup:

(Y/N)N

7.0 pH:

Extraction: (Type)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	(ug/L or ug/Kg) U	
51-28-5	2,4-Dinitrophenol	₹ 25	
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	Ū,
84-66-2	Diethylphthalate	10 2.2	JU
86-73-7	Fluorene	10	Ū
7005-72-3	4-Chlorophenyl-phenylether	10	Ū
100-01-6	4-Nitroaniline	25	Ū,
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	Ū
1912-24-9	Atrazine	10	Ū
87-86-5	Pentachlorophenol	25	Ū
85-01-8	Phenanthrene	10	Ū
120-12-7	Anthracene	10	Ū
86-74-8	Carbazole	10	Ū
84-74-2	Di-n-butylphthalate	10	Ü
206-44-0	Fluoranthene	10	Ū
129-00-0	Pyrene	10	Ū
85-68-7	Butylbenzylphthalate	10	Ū
91-94-1	3,3'-Dichlorobenzidine	10	Ū
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 2.8	JB // ;
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b) fluoranthene	10	U
207-08-9	Benzo(k) fluoranthene	10	Ū
50-32-8	Benzo(a)pyrene	10	Ū
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	Ū
191-24-2	Benzo(g,h,i)perylene	10	Ū
(1) - C	annot be separated from Diphenylamine	<u> </u>	

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

Contract: OLM04-REVS

GW04PB

Lab Name: COMPUCHEM

MB-6

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-8

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: RZ1067-8A70

Level: (low/med)

Date Received: 05/01/03

% Moisture: ____ Decanted: (Y/N)

LOW

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/12/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type) CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 9

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
		======	*****	====
1.	UNKNOWN	5.98	4	J ·
2.	UNKNOWN	7.51	12	J_
3.	UNKNOWN	9.39	3	J
4.	UNKNOWN	9.63	4	J
5.	UNKNOWN	11.79	2	J
6. 934-34-9	2 (3H) -BENZOTHIAZOLONE	12.22		NJ
7.	UNKNOWN	16.41	17	
8.	UNKNOWN	16.71	3	J
9.	UNKNOWN	17.91	7	J_
10.				
11.				
12.				
13.				
14.				
15.				
16. 17.				
17.				
18.				
19. 20.				
21.				
22.				
23.				
24.				
25				
26.				
27.	——————————————————————————————————————			
28.				
29.				
30.			-	

FORM I SV-TIC

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAS No.:

EPA SAMPLE NO.

GW05PB Contract: OLM04-REVS MB-7

Lab Name: COMPUCHEM

Case No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-9

'Sample wt/vol:

Lab Code: LIBRTY

1000 (g/mL) ML Lab File ID: RZ1067-9A70

Level:

(low/med) LOW Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/12/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

Extraction: (Type)

CONT

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) <u>UG/L</u>

100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	Ū
111-44-4	bis(2-Chloroethyl)ether	10	Ū
95-57-8	2-Chlorophenol	10	Ū
95-48-7	2-Methylphenol	10	Ū
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
98-86-2	Acetophenone	10	Ū
106-44-5	4-Methylphenol	10	Ū
621-64-7	N-Nitroso-di-n-propylamine	10	Ū
67-72-1	Hexachloroethane	10	Ū
98-95-3	Nitrobenzene	10	Ū
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	Ū
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	10	Ü
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U Z
87-68-3	Hexachlorobutadiene	10	Ŭ 🧐
105-60-2	Caprolactam	10 2	811 3
59-50-7	4-Chloro-3-methylphenol	10	U 74
91-57-6	2-Methylnaphthalene	10	Ūv
77-47-4	Hexachlorocyclopentadiene	10	VUJO
88-06-2	2,4,6-Trichlorophenol	10	U 🔊
95-95-4	2,4,5-Trichlorophenol	25	U
92-52-4	1,1'-Biphenyl	10	Ū
91-58-7	2-Chloronaphthalene	10	Ŭ
88-74-4	2-Nitroaniline	25	Ŭ
131-11-3	Dimethylphthalate	10	Ū
606-20-2	2,6-Dinitrotoluene	10	Ū
208-96-8	Acenaphthylene	10	Ū
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	Ŭ

FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

GW05PB MB-7 Contract: OLM04-REVS

Lab Name: COMPUCHEM

Lab Code: LIBRTY Case No.: SAS No.:

SDG No.: RZ1067

EPA SAMPLE NO.

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-9

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: RZ1067-9A70

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: ____ decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 05/12/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CONCENTRATION UNITS:

CAS NO. COMPOUND (uq/L or ug/Kg) UG/L Q 51-28-5 2,4-Dinitrophenol 100-02-7 4-Nitrophenol 132-64-9 Dibenzofuran 121-14-2 2,4-Dinitrotoluene 84-66-2 Diethylphthalate 86-73-7 Fluorene 10 7005-72-3 4-Chlorophenyl-phenylether 10 100-01-6 4-Nitroaniline 25 4,6-Dinitro-2-methylphenol N-nitrosodiphenylamine (1) 534-52-1 86-30-6 10 101-55-3 4-Bromophenyl-phenylether 10 118-74-1 Hexachlorobenzene 10 1912-24-9 | Atrazine 10 87-86-5 Pentachlorophenol TĪ Phenanthrene 10 85-01-8 IJ 120-12-7 Ħ Anthracene 10 86-74-8 84-74-2 Carbazole 10 Di-n-butylphthalate 10 Fluoranthene 206-44-0 10 129-00-0 Pyrene 10 Butylbenzylphthalate 3,3'-Dichlorobenzidine 85-68-7 10 91-94-1 10 56-55-3 Benzo (a) anthracene Chrysene bis(2-Ethylhexyl)phthalate 218-01-9 10 117-81-7 Di-n-octylphthalate Benzo(b)fluoranthene 117-84-0 205-99-2 Ū NOU 10 207-08-9 | Benzo(k)fluoranthene 10 50-32-8 | Benzo(a)pyrene 10 193-39-5 Indeno(1,2,3-cd)pyrene 53-70-3 Dibenzo(a,h)anthracene 191-24-2 Benzo(g,h,i)perylene 10 10

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM

Contract: OLM04-REVS

GW05PB MB-7

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Code: LIBRTY Case No.:

Lab Sample ID: RZ1067-9

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: RZ1067-9A70

Level: (low/med) LOW

Date Received: 05/01/03

% Moisture: Decanted: (Y/N) Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 05/12/03

Injection Volume: 2.0(uL)

Number TICs found: 2

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Extraction: (Type) CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER COMPOUND NAME RTEST. CONC. Q **UNKNOWN** 4.94 UNKNOWN 19.62 3. 4. 5. 8. 9. 10. 14. 15. 16. 18. <u> 19.</u> 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. <u>30.</u>

FORM I SV-TIC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: COMPUCHEM Contract: OLM04-REVS MB-8

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-10A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: ____ decanted: (Y/N) · Date Extracted: 05/05/03

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

100-52-7	Benzaldehyde	10	Ŭ
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	Ū
95-57-8	2-Chlorophenol	10	Ü
95-48-7	2-Methylphenol	10	Ū
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	Ū
67-72-1	Hexachloroethane	10	Ü
98-95-3	Nitrobenzene	10	Ü
78-59-1	Isophorone	10	Ü
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	Ü
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	10	Ü
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	Ü
87-68-3	Hexachlorobutadiene	10	Ū
105-60-2	Caprolactam	10	Ü
59-50-7	4-Chloro-3-methylphenol	10	Ü
91-57-6	2-Methylnaphthalene	10	Ü
77-47-4	Hexachlorocyclopentadiene	10	YUJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U Car
92-52-4	1,1'-Biphenyl	10	D 3/2/10
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	Ü
131-11-3	Dimethylphthalate	10	Ü
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	Ŭ
83-32-9	Acenaphthene	10	Ū

FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW06PB MB-8 Contract: OLM04-REVS

Lab Name: COMPUCHEM

SDG No.: RZ1067

Lab Code: LIBRTY

Case No.:

SAS No.:

Matrix: (soil/water) WATER

1000 (g/mL) ML Lab Sample ID: RZ1067-10 Lab File ID: RZ1067-10A70

Sample wt/vol:

Level:

(low/med) LOW Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/12/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L O

CAS NO.	COMPOUND	(dg/L or dg/kg) or	3/TI Q
51-28-5	2,4-Dinitrophenol	R-25	- U -
100-02-7	4-Nitrophenol	25	TT AND
132-64-9	Dibenzofuran	10	U Jaloulo ?
121-14-2	2,4-Dinitrotoluene	10	U 4/246
84-66-2	Diethylphthalate	10	Ū
86-73-7	Fluorene	10	Ū
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	Ü
534-52-1	4,6-Dinitro-2-methylphenol	25	Ū
86-30-6	N-nitrosodiphenylamine (1)	10	Ü
101-55-3	4-Bromophenyl-phenylether	10	Ū
118-74-1	Hexachlorobenzene	10	Ü
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	Ū
85-01-8	Phenanthrene	10	Ū
120-12-7	Anthracene	10	Ū
86-74-8	Carbazole	10	Ü
84-74-2	Di-n-butylphthalate	10	Ü
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	Ū
85-68-7	Butylbenzylphthalate	10	Ŭ
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a) anthracene	10	U
218-01-9	Chrysene	10	บ
117-81-7	bis(2-Ethylhexyl)phthalate	10 2.8	JB U
117-84-0	Di-n-octylphthalate	10	Ü
205-99-2	Benzo(b)fluoranthene	10	U W
207-08-9	Benzo(k) fluoranthene	10	Ualues
50-32-8	Benzo(a) pyrene	10	UAL
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	Ü
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

EPA SAMPLE NO. SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

Contract: OLM04-REVS Lab Name: COMPUCHEM

ML

Decanted: (Y/N)___

GW06PB MB-8

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-10

Sample wt/vol: 1000 (g/mL)

Lab File ID: RZ1067-10A70

Level: (low/med)

Date Received: 05/01/03

% Moisture:

LOW

N

Date Extracted:05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/12/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)

pH: 7.0

Extraction: (Type) CONT

CONCENTRATION UNITS:

Number TICs found: 30 (ug/L or ug/Kg) UG/L

CAS NUMBER	1				
1. UNKNOWN 4.86 22 J 2. UNKNOWN 5.12 5 J 3. UNKNOWN 6.39 88 J 4. UNKNOWN 8.69 8 J 5. 485-47-2 MINHYDRIM INKNOWN 9.09 12 W 6. UNKNOWN 9.32 7 U 7. UNKNOWN 9.39 9.80 5 J 8. UNKNOWN 10.29 5 J 9. UNKNOWN 11.73 5 J 10. UNKNOWN 14.64 6 J 11. UNKNOWN 14.69 5 J 12. UNKNOWN 14.69 5 J 12. UNKNOWN 15.46 5 J 13. UNKNOWN 15.46 5 J 14. UNKNOWN 15.46 5 J 15. UNKNOWN 15.46 5 J 16. UNKNOWN 15.48 6 J 17. UNKNOWN 15.48 6 J 16. UNKNOWN 15.48 6 J 17. UNKNOWN 15.48 6 J 18. UNKNOWN 15.48 6 J 17. UNKNOWN 16.42 16 J 18. UNKNOWN 16.54 6 J 19. UNKNOWN 16.54 6 J 19. UNKNOWN 16.54 6 J 20. UNKNOWN 16.54 6 J 21. UNKNOWN 16.54 6 J 22. UNKNOWN 16.54 6 J 23. UNKNOWN 16.54 6 J 24. UNKNOWN 18.15 8 J 24. UNKNOWN 18.20 10 J 23. UNKNOWN 18.20 10 J 23. UNKNOWN 18.20 10 J 24. UNKNOWN 18.88 6 J 24. UNKNOWN 18.95 9 J 25. UNKNOWN 19.38 15 J 26. UNKNOWN 19.38 15 J 27. UNKNOWN 19.38 15 J 28. UNKNOWN 19.51 8 J 29. UNKNOWN 19.51 8 J 29. UNKNOWN 19.51 8 J	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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3. UNKNOWN 6.39 8 J 4. UNKNOWN 8.69 8 J 5. 485-47-2 MINITEDIN UNKNOWN 9.09 12 MJ 6. UNKNOWN 9.32 7 J 7. UNKNOWN 10.29 5 J 8. UNKNOWN 10.29 5 J 9. UNKNOWN 11.73 5 J 10. UNKNOWN 14.64 6 J 11. UNKNOWN 14.69 5 J 12. UNKNOWN 14.69 5 J 13. UNKNOWN 15.46 5 J 14. UNKNOWN 15.46 5 J 14. UNKNOWN 15.46 5 J 15. UNKNOWN 15.46 5 J 16. UNKNOWN 15.46 5 J 17. UNKNOWN 16.42 16 J 18. UNKNOWN 16.42 16 J 19. UNKNOWN 16.54 6 J 19. UNKNOWN 16.54 6 J 19. UNKNOWN 16.54 6 J 20. UNKNOWN 16.54 6 J 21. UNKNOWN 16.54 6 J 22. UNKNOWN 16.54 6 J 23. UNKNOWN 16.54 6 J 24. UNKNOWN 18.15 8 J 24. UNKNOWN 18.20 10 J 23. UNKNOWN 18.95 9 J 24. UNKNOWN 18.95 9 J 25. UNKNOWN 19.45 11 J 26. UNKNOWN 19.45 11 J 27. UNKNOWN 19.45 11 J 28. UNKNOWN 19.45 11 J 29. UNKNOWN 19.45 11 J	1				
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28. UNKNOWN 19.51 8 J 29. UNKNOWN 20.23 10 J	27.				
29. UNKNOWN 20.23 10 J					
	30.	UNKNOWN	20.32	6	J

FORM I SV-TIC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

GW02PB

Lab Name: COMPUCHEM

Contract: OLM04~REVS

MB-9

EPA SAMPLE NO.

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-6

Sample wt/vol:

1050 (g/mL) ML

Lab File ID: RZ1067-6A70

Level: (low/med)

LOW

Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)____

Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 05/09/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 6.0

Extraction: (Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

100-52-7	Benzaldehyde	10	Ŭ
108-95-2	Phenol	10	Ū
111-44-4	bis(2-Chloroethyl)ether	10	Ū
95-57-8	2-Chlorophenol	10	Ū
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
98-86-2	Acetophenone	10	Ū
106-44-5	4-Methylphenol	10	Ū
621-64-7	N-Nitroso-di-n-propylamine	10	Ü
67-72-1	Hexachloroethane	10	O
98-95-3	Nitrobenzene	10	Ū
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	1.0	Ū
105-67-9	2,4-Dimethylphenol	10	Ū
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	10	Ū
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	Ü
105-60-2	Caprolactam	10	<u>ט</u>
59-50-7	4-Chloro-3-methylphenol	10	Ü
91-57-6	2-Methylnaphthalene	n 10	Ŭ,
77-47-4	Hexachlorocyclopentadiene	9 10	ZNA
88-06-2	2,4,6-Trichlorophenol	10	UOL
95-95-4	2,4,5-Trichlorophenol	24 25	
92-52-4	1,1'-Biphenyl	10	11 1/10
91-58-7	2-Chloronaphthalene	J 10	
88-74-4	2-Nitroaniline	6 24 23	Ü
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	Ü
208-96-8	Acenaphthylene	3 10	Ü
99-09-2	3-Nitroaniline	32425	Ü
83-32-9	Acenaphthene	10	U

FORM I SV-1

1D SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW02PB MB-9

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-6

Sample wt/vol:

1050

Lab File ID: RZ1067-6A70

Level:

(low/med)

(g/mL) ML

Date Received: 05/01/03

% Moisture:

LOW

N

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/09/03

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)

pH: 6.0

Extraction:

(Type)

CONT

CAS NO

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	(ug/L or ug/kg) <u>uc</u>	화다. ਨ 🎢
51-28-5	2,4-Dinitrophenol	24 25	1 1 1 1 T
100-02-7	4-Nitrophenol	24 25	\
132-64-9	Dibenzofuran	1.0	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10 0.3	7 U
86-73-7	Fluorene	10	' U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	24 25	Ū
534-52-1	4,6-Dinitro-2-methylphenol	24 28	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	<u> </u>
118-74-1	Hexachlorobenzene	10	U V
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	24,25	U
85-01-8	Phenanthrene	10	Ū
120-12-7	Anthracene	10	Ū
86-74-8	Carbazole	10	Ū
84-74-2	Di-n-butylphthalate	10 0.5	JBU
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	Ū
85-68-7	Butylbenzylphthalate	10 9.4	JB U
91-94-1	3,3'-Dichlorobenzidine	1.0	U
56-55-3	Benzo(a)anthracene	10	Ü.
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 8	U SU
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U 8
207-08-9	Benzo(k)fluoranthene	10	่ [บั
50-32-8	Benzo(a) pyrene	10	Ū
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	Ü
191-24-2	Benzo(g,h,i)perylene	10	Ū
(1)	annot be separated from Diphenylamine		

(1) - Cannot be separated from Diphenylamine

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

GW02PB MB-9

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-6

Sample wt/vol: 1050 (g/mL)

Lab File ID: RZ1067-6A70

Level:

(low/med)

Date Received: 05/01/03

% Moisture:

Decanted: (Y/N)

LOW

Date Extracted:05/05/03

Concentrated Extract Volume:

1000 (uL)

ML

Date Analyzed: 05/09/03

Extraction: (Type) CONT

Injection Volume:

Number TICs found:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 6.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.39	18	
2.	UNKNOWN	5.69	2	J
3.	UNKNOWN	6.76	3	J
4.	UNKNOWN	8.84	2	J
5. 10544-50-0	SULFUR, MOL. (S8)	15.86	3	ŊĴ
6.				
7.		·		
8.		 		
9.				<u> </u>
10. 11.		[]	···	
12.		 		
13.		 		} -
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23.				<u></u>
24. 25.				
26.		 		
27.		 		
28.				
29.				
30.				

FORM I SV-TIC

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

GW01PB

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

MB-10

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-5

Sample wt/vol:

925

(g/mL) ML

decanted: (Y/N)___

Lab File ID: RZ1067-5A70

Level:

(low/med)

Date Received: 05/01/03

% Moisture:

LOW

Date Extracted: 05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/09/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 6.0

Extraction:

(Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

100-52-7	Benzaldehyde	11	U
108~95-2	Phenol	11	Ū
111-44-4	bis(2-Chloroethyl)ether	11	Ŭ
95-57 - 8	2-Chlorophenol	11	U
95-48-7	2-Methylphenol	11	Ū
108-60-1	2,2'-oxybis(1-Chloropropane)	11	Ū
98-86-2	Acetophenone	0.6	J
106-44-5	4-Methylphenol	11	U
621-64-7	N-Nitroso-di-n-propylamine	11	Ū
67-72-1	Hexachloroethane	11	Ü
98-95-3	Nitrobenzene	11	U
78-59-1	Isophorone	11	Ü
88-75-5	2-Nitrophenol	11	Ū
105-67-9	2,4-Dimethylphenol	11	Ü
111-91-1	bis(2-Chloroethoxy)methane	11	Ū
120-83-2	2,4-Dichlorophenol	11	U
91-20-3	Naphthalene	2	J
106-47-8	4-Chloroaniline	11	U
87-68-3	Hexachlorobutadiene	11	Ū
105-60-2	Caprolactam	11	Ū
59-50-7	4-Chloro-3-methylphenol	11	Ū
91-57-6	2-Methylnaphthalene	11	Ū
77-47-4	Hexachlorocyclopentadiene	11	JU K
88-06-2	2,4,6-Trichlorophenol	11	TT 1
95-95-4	2,4,5-Trichlorophenol	27	U OU
92-52-4	1,1'-Biphenyl	0.4	U (1/\b) /
91-58-7	2-Chloronaphthalene	11	<u>U 3\7</u>
88-74-4	2-Nitroaniline	27	Ū
131-11-3	Dimethylphthalate	11	Ü
606-20-2	2,6-Dinitrotoluene	11	U
208-96-8	Acenaphthylene	11	Ū
99-09-2	3-Nitroaniline	27	Ū
83-32-9	Acenaphthene	11	U
			L———— I

FORM I SV-1

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Contract: OLM04-REVS

GW01PB MB-10

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-5

Sample wt/vol:

925

(g/mL) ML

Lab File ID: RZ1067-5A70

Level:

(low/med)

LOW

Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Concentrated Extract Volume:

1000 (uL)

Date Extracted: 05/05/03 Date Analyzed: 05/09/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 6.0

Extraction:

(Type)

CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO. COMPOUND

			 -	
5	1-28-5		27	8 U.S
10	0-02-7	4-Nitrophenol	27	U ,
13	2-64-9	Dibenzofuran	11	ע אין ט
12	1-14-2	2,4-Dinitrotoluene	11	U J
8	4-66-2	Diethylphthalate	11	<u>U '</u> '
8	6-73-7	Fluorene	11	Ū
700	5-72-3	4-Chlorophenyl-phenylether	77 7	ti

132-04-3	DIDENZOLUTAN	<u> </u>	0 /100
121-14-2	2,4-Dinitrotoluene	11	U 3/21
84-66-2	Diethylphthalate	11	
86-73-7	Fluorene	11	Ŭ
7005-72-3	4-Chlorophenyl-phenylether	11	Ū
100-01-6	4-Nitroaniline	27	U
534-52-1	4,6-Dinitro-2-methylphenol	27	Ū
86-30-6	N-nitrosodiphenylamine (1)	11	Ü
101-55-3	4-Bromophenyl-phenylether	11	Ū
118-74-1	Hexachlorobenzene	11	ับ
1912-24-9	Atrazine	11	Ū
87-86-5	Pentachlorophenol	27	Ū
85-01-8	Phenanthrene	0.3	J
120-12-7	Anthracene	11	Ū
86-74-8	Carbazole	11	Ū
84-74-2	Di-n-butylphthalate	11	Ū
206-44-0	Fluoranthene	11	Ū
129-00-0	Pyrene	_ 11	Ü
85-68-7	Butylbenzylphthalate	11	Ū
91-94-1	3,3'-Dichlorobenzidine	11	U
56-55-3	Benzo(a)anthracene	11	ט
218-01-9	Chrysene	11	Ū
117-81-7	bis(2-Ethylhexyl)phthalate	\mathcal{X}	ال كالر
117-84-0	Di-n-octylphthalate	11	Ŭ,
205-99-2	Benzo(b)fluoranthene	11	UMV
207-08-9	Benzo(k)fluoranthene	11	ام ا
50-32 - 8	Benzo(a)pyrene	11	<u>n 3/3/6</u>
193-39-5	Indeno(1,2,3-cd)pyrene	11	U '
F 2 7 2 2			

Benzo(g,h,i)perylene (1) - Cannot be separated from Diphenylamine

Dibenzo (a, h) anthracene

FORM I SV-2

OLM04.2

Ū

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM

Contract: OLM04-REVS

GWOIPB MB-10

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

EPA SAMPLE NO.

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-5

Sample wt/vol: 925 (g/mL)

ML

Lab File ID: RZ1067-5A70

Level:

(low/med)

Concentrated Extract Volume:

LOW

Date Received: 05/01/03

% Moisture: Decanted: (Y/N)___

Date Extracted: 05/05/03

1000 (uL)

Date Analyzed: 05/09/03

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 6.0

Extraction: (Type) CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 6

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	6.74	3	J
2. 128-37-0	BUTYLATED HYDROXYTOLUENE	10.70		NJ
3.	UNKNOWN	11.69		J
4.	UNKNOWN	14.99		J
5. 57-11-4	OCTADECANOIC ACID	16.46	11	ŊJ
6. *	UNKNOWN	22.76	20	J
7.			•	
8.				
9.				
10.	Like Wages hile O as als	<u></u>		
11. # pee	Mkane Narrative Report	<u> </u>		
13.	M9	1850 71	21/03	
14.	C C	VA DON TI	7-5	
15.				
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30.	<u> </u>			

FORM I SV-TIC

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

FB

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-1

Sample wt/vol:

925

N

(q/mL) ML

Lab File ID: RZ1067-1A70

Level:

(low/med)

LOW

Date Received: 05/01/03

% Moisture:

decanted: (Y/N)

Date Extracted: 05/05/03

Concentrated Extract Volume:

Date Analyzed: 05/09/03

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)

pH: 5.0

1000 (uL)

Extraction: (Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

			
100-52-7	Benzaldehyde	11	U
108-95-2	Phenol	11	U
111-44-4	bis(2-Chloroethyl)ether	11	Ū
95-57-8	2-Chlorophenol	11	Ū
95-48-7	2-Methylphenol	11	U
108-60-1	2,2'-oxybis(1-Chloropropane)	11	Ū
98-86-2	Acetophenone	11	U
106-44-5	4-Methylphenol	11	Ū
621-64-7	N-Nitroso-di-n-propylamine	11	Ū
67-72-1	Hexachloroethane	11	Ü
98-95-3	Nitrobenzene	11	Ū
78-59-1	Isophorone	11	Ū
88-75-5	2-Nitrophenol	. 11	U
105-67-9	2,4-Dimethylphenol	11	U
111-91-1	bis(2-Chloroethoxy)methane	11	Ü
120-83-2	2,4-Dichlorophenol	11	Ū
91-20-3	Naphthalene	11	Ū
106-47-8	4-Chloroaniline	11	Ū
87-68-3	Hexachlorobutadiene	11	Ū
105-60-2	Caprolactam	15	
59-50-7	4-Chloro-3-methylphenol	11	U
91-57-6	2-Methylnaphthalene	11	U
77-47-4	Hexachlorocyclopentadiene	11	VUJ
88-06-2	2,4,6-Trichlorophenol	11	Ū
95-95-4	2,4,5-Trichlorophenol	27	U AAV.
92-52-4	1,1'-Biphenyl	11	UCAL
91-58-7	2-Chloronaphthalene	11	U disilo
88-74-4	2-Nitroaniline	27	U 1/21
131-11-3	Dimethylphthalate	11	Ŭ
606-20-2	2,6-Dinitrotoluene	11	Ū
208-96-8	Acenaphthylene	11	U
99-09-2	3-Nitroaniline	27	Ü
83-32-9	Acenaphthene	11	Ū

FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Contract: OLM04-REVS

SDG No.: RZ1067 Lab Code: LIBRTY Case No.: SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-1

Lab Name: COMPUCHEM

Sample wt/vol: 925 (g/mL) ML Lab File ID: RZ1067-1A70

Level: (low/med) LOW Date Received: 05/01/03

Date Extracted: 05/05/03 % Moisture: decanted: (Y/N)

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/09/03

Dilution Factor: 1.0 Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N Extraction: pH: 5.0 (Type) CONT

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

51-28-5	2,4-Dinitrophenol	27	Ø	UI
100-02-7	4-Nitrophenol	27	ับ	· •
132-64-9	Dibenzofuran	11	Ū	cae
121-14-2	2,4-Dinitrotoluene	11	บ	
84-66-2	Diethylphthalate	0.3	J	_ A \S^\
86-73-7	Fluorene	11	Ū	
7005-72-3	4-Chlorophenyl-phenylether	11	Ū	
100-01-6	4-Nitroaniline	27	U	
534-52-1	4,6-Dinitro-2-methylphenol	27	Ü	
86-30-6	N-nitrosodiphenylamine (1)	11	Ū	
101-55-3	4-Bromophenyl-phenylether	11	Ū	
118-74-1	Hexachlorobenzene	11	U	
1912-24-9	Atrazine	. 11	บ	
87-86-5	Pentachlorophenol	27	บ	
85-01-8	Phenanthrene	11	Ū	
120-12-7	Anthracene	11	Ū	
86-74-8	Carbazole	11	U	
84-74-2	Di-n-butylphthalate	11 2.5	JE	UN
206-44-0	Fluoranthene	11	U	7
129-00-0	Pyrene	11	υ	
85-68-7	Butylbenzylphthalate	110,6	JB	u.
91-94-1	3,3'-Dichlorobenzidine	11	Ū	- 4
56-55-3	Benzo(a) anthracene	11	כ	
218-01-9	Chrysene	11	ט	
117-81-7	bis(2-Ethylhexyl)phthalate	11	Ü	
117-84-0	Di-n-octylphthalate	11	Ū	
205-99-2	Benzo(b)fluoranthene	11	Ū	
207-08-9	Benzo(k)fluoranthene	11	Ū	
50-32-8	Benzo(a)pyrene	11	Ü	
193-39-5	Indeno(1,2,3-cd)pyrene	11	Ü	
53-70-3	Dibenzo(a,h)anthracene	11	Ū	
191-24-2	Benzo(g,h,i)perylene	11	Ū	

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

OLM04.2

EPA SAMPLE NO.

GW09FBPB

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

1-	
	GW09FBPB
50	GNOJEBEB

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RZ1067

Matrix: (soil/water) WATER

Lab Sample ID: RZ1067-1

Sample wt/vol: 925 (g/mL)

ML

Lab File ID: RZ1067-1A70

Level: (low/med)

LOW

Date Received: 05/01/03

% Moisture: ____ Decanted: (Y/N) ___ Date Extracted:05/05/03

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 05/09/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

Extraction: (Type) CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
====================================	UNKNOWN	4 04		J
1.	ON RIVORN	4.94		-
3.	 	<u> </u>	 	
4.				
5.				
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19. 20. 21. 22. 23.		<u> </u>		
20.				
21.				
-22.				
23.				
25.				-
26.				
27				
29.				
30.		·····		

FORM I SV-TIC

ALKANE NARRATIVE REPORT Report date : 05/14/2003 SDG: RZ1067

Client Sample ID: GW01PB Compound	Lab Sample	ID: RZ1067 RT	-5 Est. Con	File ID:	RZ1067-5A70
Unknown Alkane		16.65	3	J	-
Straight-Chain Alkane		17.24	3 6	Ĵ	
Straight-Chain Alkane		17.78	11	J	
Straight-Chain Alkane		18.29	11	J	
Straight-Chain Alkane	•	18.76	14	J	
Branched Alkane		19.23	11	J	
Straight-Chain Alkane		19.75	20	J	
Branched Alkane	•	20.33	13	J	
Straight-Chain Alkane		21.01	22	J J	
Straight-Chain Alkane		21.81	13	J	
Straight-Chain Alkane Unknown Alkane		23.80	12	J	
Unknown Alkane		24.60	16	Ĵ	
Unknown Alkane		25.40	8 9	J J J	
		26.30	_		
unknown Alkane		22.76	20	J	Carutson 7/21/03
Client Sample ID: GW04PB Compound	Lab Sample	ID: RZ1067 RT	-8 Est. Con	rire in:	RZ1067-8A70
Unknown Alkane		6.74	4	J	-



ATTACHMENT C

LIBRARY SEARCHES, PER SECTION XI SDG No. RZ1067 Semivolatiles in Water Marion Bragg Landfill - April 2003 Data File: /chem/5972hp70.i/DF030509A70.b/RZ1067-5A70.d

Date: 09-HAY-2003 18:22

Client (D: GWO1PB

Instrument: 5972hp70.i

Sample Info:

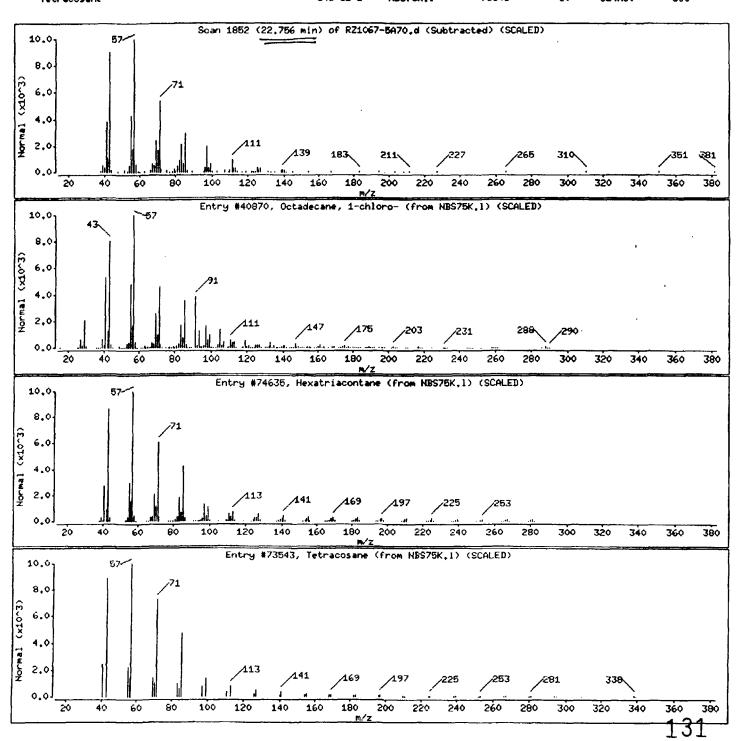
Valume Injected (uL): 2.0

 (uL): 2.0
 Operator: 2519

 IX-5HS
 Column diameter: 0.25

Column phase: RTX-5MS

Library Search Compound Match CAS Number Library Entry Quality Formula Weight Unknown 3386-33-2 NBS75K.1 40870 53 C18H37C1 Octadecane, 1-chloro-288 C36H74 507 630-06-8 NBS75K.1 74635 50 **Hexatriacontane** 646-31-1 73543 C24H50 338 Tetracosane NBS75K.1 50



Data File: /chem/5972hp70.i/DF030512A70.b/RZ1067-10A70.d

Date: 12-HAY-2007 11:55

Client (D: GHO6PB

Instrument: 5972hp70.i

Sample Info:

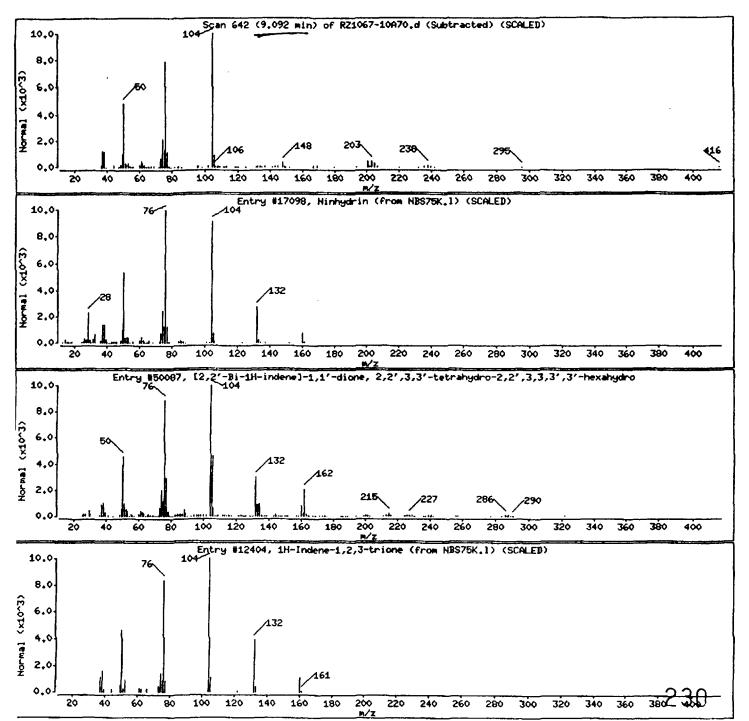
Volume Injected (uL); 2.0

Operator: 2519

Column phase: RTX-5HS

Column diameter: 0.25

Library Search Compound Hatch	CAS Number	Library	Entry	Quality	Formula	Height
Ninhydrin	485-47-2	NBS75K.1	17098	91	C9H6O4	178
[2,2'-Bi-1H-indene]-1,1'-dione, 2,2',3,3	5 95 0-69-6	NBS75K,1	50087	83	C18H1408	358
1H-Indene-1,2,3-trione	938-24-9	NBS75K,1	12404	. 83	C9H4O3	160





DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA Total Suspended Solids, Chloride, and Ammonia in Water

Sample Delivery Group No. RX1067 April 2003 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

July 7, 2003



EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (total suspended solids [TSS], ammonia, and chloride) prepared by CompuChem Environmental for five water samples from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were issued by the laboratory in a single data package under Sample Delivery Group (SDG) No. RX1067, which was received for review on June 12, 2003, with additional information provided on July 7, 2003. The following field samples were reported:

PW01PB (PW-1)	SW01PB (SW-1)	SW01DPPB (SW-1D)
SW02PB (SW-5)	SW03PB (SW-6)	5

Based on the validation effort, the sample results were corrected as follows:

- Results for TSS in all five site samples were rounded to reflect two significant figures.
- Reporting limits for ammonia and TSS were adjusted to reflect two significant figures.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section X). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section IX.

This validation report should be considered <u>part of the data package</u> for all future distributions of the wet chemistry data.



INTRODUCTION

Analyses for the requested parameters were performed by the laboratory according to the following analytical methods:

Ammonia - EPA 350.1 Chloride - EPA 300.0 Total Suspended Solids (TSS) - EPA 160.2

These methods are found in "Methods for Chemical Analysis of Water and Wastes," EPA 600/4-79/020, Rev. 3/83.

Since no validation guidelines specific to the analytical methods used are available, the validation was based on the requirements of the referenced procedures, the specifications of the project-specific Quality Assurance Project Plan (QAPP) and best professional judgment. The validation approach was similar to that described in USEPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994).

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that each data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the findings of this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's validation guidelines:

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- R The data are unusable. (Note: Analyte may or may not be present.)
- J The associated value is an estimated quantity.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data table in Attachment A and the Classical Chemistry Analyses Data Sheets (Form Is) in Attachment B to qualify the results as appropriate according to the review of the data package.



Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The samples were collected 4/29/03. Analyses for all parameters were conducted within the holding times specified by the referenced methods and the QAPP (28 days from collection for chloride and ammonia; seven days from collection for TSS).

Physical preservation of all samples with ice was documented by the sampler on the applicable chain of custody (COC) record, and acceptable cooler temperatures (2.0-6.0°C; QC 4°C \pm 2°C) on laboratory receipt were also documented on the COC.

Chemical preservation of the samples for ammonia analysis with sulfuric acid was also clearly documented on the COC record, and acceptable pHs (<2) were recorded by the laboratory on the COC and on the applicable receiving log.

II. Calibrations

All samples were analyzed for chloride on 5/5/03. An initial calibration incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 50 mg/L was performed on 2/19/03 and documented in the data package. The reported correlation coefficient for the linear regression describing the best-fit curve was acceptable (>0.995) but could not be reproduced exactly by the validator, likely due to the weighting factor used by the laboratory. No action was necessary on this basis. ICV/CCV standards were run at appropriate frequencies during the chloride analysis series and all showed acceptable (QC 85-115%) recoveries relative to reported true values (99.8-102%).

The samples were analyzed for ammonia on 5/6/03. A calibration curve incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 8 mg/L was documented for this date. The reported correlation coefficient for the linear regression describing the best-fit curve for this IC was acceptable (>0.995) and was verified by the validator. ICV/CCV standards were run at appropriate frequencies during the ammonia analysis series and showed acceptable (QC 85-115%) recoveries relative to reported true values (101-104%). However, since only final results are displayed in the raw data documentation (i.e., absorbance values are not provided), these results cannot be verified by the validator.

Calibration is not applicable to the weight measurements used to determine TSS.

III. Blanks

No contamination was reported in any of the method blanks associated with the sample analyses; these results are supported by the raw data available in the data package.



No field-submitted blanks were included in this data set.

IV. Laboratory Control Samples

Laboratory control samples prepared and analyzed with the samples for all three analysis parameters showed acceptable recoveries (Lab QC 85-115%), ranging from 98.0-101%.

V. Laboratory Duplicate Analysis

Sample SW01PB was analyzed in duplicate for TSS by the laboratory. Excellent reproducibility was demonstrated by these paired analyses, with a relative percent difference (RPD) of 0%.

No laboratory duplicate analyses were performed for chloride or ammonia on any of the samples in this data set.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD analyses were performed on sample SW01PB for ammonia and chloride. Recoveries for ammonia (101% and 101%) and chloride (101% and 102%) were acceptable and measured concentrations showed excellent reproducibility, with RPDs of 0.2% and 0.6%, respectively (QC 80-120% Recovery and \leq 20 RPD).

VII. Field Duplicates

Samples SW01PB and SW01DPPB were identified as a field duplicate pair. Positive paired results showed good reproducibility for chloride (2 RPD) and TSS (13 RPD). Ammonia was not detected in either sample; therefore, no further quantitative evaluation of precision could be made using these data.

VIII. Sample Results Verification

Results for TSS and chloride were correctly calculated and accurately reported for the samples in this data set based on review of the available raw data. Ammonia results were correctly transcribed from the raw data; since only direct readings of the final results were documented, no verification of the reported results could be made by the validator.



All samples were analyzed at 5-fold dilutions for chloride. Therefore, the reporting limit (RL) for this parameter on the data table in Attachment A was adjusted by the validator to reflect this dilution factor.

Sample results and RLs were reported to inconsistent significant figures and are not in accordance with previously-defined CompuChem policy, which states that values greater than 10 are reported to three significant figures and values less than 10 are reported to two significant figures. For consistency with historical data generated in support of this project, all results greater than or equal to 10 mg/L were adjusted to reflect three significant figures and values less than 10 mg/L (including RLs) were adjusted to reflect two significant figures, where necessary. Specifically, the following actions were taken:

- The positive results for TSS in all five samples were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.
- RLs for ammonia and TSS were adjusted to reflect two significant figures (instead of three or four, as reported by the laboratory).

The data table in Attachment A lists all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation effort.

IX. Documentation

A chain of custody (COC) record present in the data package included all reported samples. The following issues were noted:

- A copy of the courier airbill was not included in the data package to document the shipment portion of the sample transfers. The airbill number, however, was documented on the COC record.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

For ammonia, absorbance readings were provided for the IC standards but only direct readings of the final results were documented in the raw data for all runs performed during the sample



analysis series. Therefore, the results reported for these analyses could not be verified by the validator. At the discretion of the data user, the laboratory may be requested to provide this documentation in future data packages prepared in support of this project.

The true values for chloride in the ion chromatography ICV/CCV standards were not documented in the data package. At the request of the validator, these values were provided by the laboratory via facsimile on 7/7/03 (see Attachment C).

Most of these documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

X. Overall Assessment

Sample results for the three wet chemistry parameters were corrected as follows based on the validation effort:

- Results for TSS in all five site samples were rounded to reflect two significant figures (instead of three significant figures, as reported by the laboratory).
- RLs for ammonia and TSS were adjusted to reflect two significant figures (instead of three or four, as reported by the laboratory).

Documentation issues are discussed in Section IX.

This validation report should be considered <u>part of the data package</u> for all future distributions of the wet chemistry data.



ATTACHMENT A

DATA TABLE

Wet Chemistry - SDG No. RX1067 April 2003 Sample Collections - Marion Bragg Landfill

Marion Bragg Landfill - April 2003 - Wet Chemistry Parameters in Surface Water

1	Į.
ı	×
ı	Resu
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ı	2
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Ammonia Chloride Total Suspended Solids	Collection Point Sample ID Lab Sample No. Collection Date
0.10 2.0 1.0	RL.
0.10 U 17.1 6.4	PW-1 PW01PB RX1067-5 4/29/03
0.10 U 41.2 4.8	SW-1 SW01PB SW067-1 4/29/03
0.10 U 40.5 4.2	SW-1D SW01DPPB RX1067-2 4/29/03
0.10 U 40.3 2.2	SW-5 SW02PB RX1067-3 4/29/03
0.10 U 53.8 2.0	SW-6 SW03PB RX1067-4 4/29/03



ATTACHMENT B

CLASSICAL CHEMISTRY ANALYSES DATA SHEETS (FORM Is)

Wet Chemistry - SDG No. RX1067 April 2003 Sample Collections - Marion Bragg Landfill

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE'NO.

Lab Name: C	ompuChem			Contract:				PW-I PW01	PB
Lab Code: L	IBRTY		Case l	No.:	NRAS No.:				
SDG No.: R	X1067	<u>. </u>						·	
Matrix (soil	/water):	WATER	· · · · · · · · · · · · · · · · · · ·	•	La	b Sam	ple II	D: RX1067-5	
Date Receive	d: 5/1/03				*	Solid	s: 0.	.00	
	Concen	tration Uni	ts (mg/L	or mg/kg dry v	eight	:):	mg/	/L	
	PARAMETE	R	C	ONCENTRATION	С	Ω	м	DATE ANALYZED	
	TSS		1	6.4 6.40				5/5/03	
	Ammonia			0.10 0.100	ט			5/6/03	
	Chloride)	Ī	17.1				5/5/03	

Carikson 7/8/03

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

5/5/03

Lab Name:	CompuChem		Contract:				SW-1 SW01PB		
Lab Code:	LIBRTY		Case	No.:	NRAS No.:				
SDG No.:	RX1067								٠
Matrix (so	oil/water):	WATER			La	b Sam	ple I	D: RX1067-1	
Date Recei	ved: 5/1/03				*	Solid	s: 0	. 00	
	Concen	tration Un	its (mg/	L or mg/kg dry	weight	t) :	mg,	/L	
	PARAMETI	R		CONCENTRATION	С	Q	м	DATE ANALYZED	
	Chloride)		41.2				5/5/03	
	Ammonia			0.10 -0.100	U			5/6/03	

TSS

CAE 7/8/03

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

5/5/03

Lab	Name:	Comp	ou Chem			Contract:				SW-ID SWO	1DPPB
Lab Code: LIBRTY			Case	Case No.:			NRAS No.:				
SDG	No.:	RX10	67	_				_	•		
Matr	oa) xi:	il/wa	iter):	WATER			La	b Sam	ple I	D: RX1067-	2
Date	Recei	ved:	5/1/03			•	*	Solid	ls: 0	.00	
			Concen	tration	Units (mg/	L or mg/kg dry	weigh	t) :	ng/	/L	
			PARAMETE	ER		CONCENTRATION	С	Q	м	DATE ANALYZED]
TSS			4.2-4.20	Ī			5/5/03	Ī			
			mmonia			0.10 0.100	ט			5/6/03	7
		T C	Chloride	9		40.5	1			5/5/03	7

CAE 7/8/03

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: C	CompuChem			Contract:				SW-5		
Lab Code: I	LIBRTY		Case	Case No.:		NRAS No.:				
SDG No.: E	X1067									
Matrix (soil	l/water):	WATER			La	b Sam	ple I	D: RX1067-		
Date Receive	ed: <u>5/1/03</u>				ŧ	Solid	s: 0	.00		
·	Concen	tration.U	nits (mg/	L or mg/kg dry	weight	t):	ng,	/L		
	PARAMETI	ER.		CONCENTRATION	С	Ω	м	DATE ANALYZED		
	TSS			2.2 2.20				5/5/03		
	Ammonia			0.10 0.100	ប	<u> </u>		5/6/03		
	Chloride			40.3				5/5/03		

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

5/5/03

Lab Name: (CompuChem			Contract:				SW-6		
Lab Code: LIBRTY			Case No.:			NRAS No.:				
SDG No.:	RX1067									
Matrix (soi	l/water):	WATER		_	La	b Sam	ple I	D: RX1067-4		
Date Receive	ed: <u>5/1/03</u>				*	Solid	ls: 0	.00		
	Concent	tration Un	its (mg/	L or mg/kg dry	weight	:):	ng,	/L		
	PARAME TE	R		CONCENTRATION	С	Q	м	DATE ANALYZED		
	TSS			2.0 2.00				5/5/03		
	Ammonia			0.10 0.100	U			5/6/03		

Chloride

CaE 7/8/03

53.8



ATTACHMENT C

CHLORIDE TRUE VALUES, AS PROVIDED BY THE LABORATORY ON 7/7/03

Wet Chemistry - SDG No. RX1067 April 2003 Sample Collections - Marion Bragg Landfill

True Values for IC Analysis

_	ICV	LCSW	CCV	MS & MSD
Fluoride	2.50	2.500	2.50	5.00
Chloride	20.00	25.00	25.00	40.00
Nitrite	2.50	2.500	2.50	5.00
Bromide	2.50	2.500	2.50	5.00
Nitrate	2.50	2.500	2.50	5.00
Phosphate	2.50	2.500	2.50	5.00
Sulfate	20.00	50.00	50.00	40.00

501 Madison Avenue, Cary, North Carolina 27513
Phone: (919) 379-4005 D Fax: (919) 379-4050

CompuChem Cary, North Carolina

Priority Memo

To: Carol Erichson	From Rodney A. Rain	nonde
	Pages with cover 2	
Faug 865-966-8885	Dute: 7/1/3	
Re: Tene Values	CCı	
☐ For Review ☐ Picase Comment	☐ Please Roply	☐ Please Recycle
Thank you.		
Rodney A. Reimonde 919-379-4018 (direct) 919-379-4040 (fax) maimonde@compuchemlabs.com	3	

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DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA Total Suspended Solids, Chloride, and Ammonia in Water

Sample Delivery Group No. RZ1067 April 2003 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

July 15, 2003



EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (total suspended solids [TSS], ammonia, and chloride) prepared by CompuChem Environmental for nine water samples and one field blank (FB) from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were issued by the laboratory in a single data package under Sample Delivery Group (SDG) No. RZ1067, which was received for review on July 8, 2003. The following field samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)		, ,

Based on the validation effort, the sample results were qualified or corrected as follows:

- Results for ammonia in GW08PB and GW08DPPB were rejected (R).
- Results for ammonia in all samples were rounded to reflect two significant figures.
- Results for TSS in GW03PB and GW04PB samples were rounded to reflect two significant figures.
- Reporting limits for ammonia and TSS were adjusted to reflect two significant figures.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section X). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section IX.

This validation report should be considered <u>part of the data package</u> for all future distributions of the wet chemistry data.



INTRODUCTION

Analyses for the requested parameters were performed by the laboratory according to the following analytical methods:

Ammonia - EPA 350.1 Chloride - EPA 300.0 Total Suspended Solids (TSS) - EPA 160.2

These methods are found in "Methods for Chemical Analysis of Water and Wastes," EPA 600/4-79/020, Rev. 3/83.

Since no validation guidelines specific to the analytical methods used are available, the validation was based on the requirements of the referenced procedures, the specifications of the project-specific Quality Assurance Project Plan (QAPP) and best professional judgment. The validation approach was similar to that described in USEPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994).

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that each data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the findings of this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's validation guidelines:

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- R The data are unusable. (Note: Analyte may or may not be present.)
- J The associated value is an estimated quantity.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables in Attachment A and the Classical Chemistry Analyses Data Sheets (Form Is) in Attachment B to qualify the results as appropriate according to the review of the data package.



Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The samples were collected 4/30/03. Analyses for all parameters were conducted within the holding times specified by the referenced methods and the QAPP (28 days from collection for chloride and ammonia; seven days from collection for TSS).

Physical preservation of all samples with ice was documented by the sampler on the applicable chain of custody (COC) records, and acceptable cooler temperatures (2.0-6.0°C; QC 4°C \pm 2°C) on laboratory receipt were also documented on the COCs.

Chemical preservation of the samples for ammonia analysis with sulfuric acid was also clearly documented on the COC record, and acceptable pHs (<2) were recorded by the laboratory on the COCs and on the applicable receiving logs.

II. Calibrations

All samples were analyzed for chloride on 5/5/03. An initial calibration incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 50 mg/L was performed on 2/19/03 and documented in the data package. The reported correlation coefficient for the linear regression describing the best-fit curve was acceptable (>0.995) but could not be reproduced exactly by the validator, likely due to the weighting factor used by the laboratory. No action was necessary on this basis. ICV/CCV standards were run at appropriate frequencies during the chloride analysis series and all showed acceptable (QC 85-115%) recoveries relative to reported true values (99.8-102%).

The samples were analyzed for ammonia on 5/6/03. A calibration curve incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 8 mg/L was documented for this date. The reported correlation coefficient for the linear regression describing the best-fit curve for this IC was acceptable (>0.995) and was verified by the validator. ICV/CCV standards were run at appropriate frequencies during the ammonia analysis series and showed acceptable (QC 85-115%) recoveries relative to reported true values (101-104%). However, since only final results are displayed in the raw data documentation (i.e., absorbance values are not provided), these results cannot be verified by the validator.

Calibration is not applicable to the weight measurements used to determine TSS.

III. Blanks

No contamination was reported in any of the method blanks associated with the sample analyses; these results are supported by the raw data available in the data package.



One field blank (GW08FBPB) was submitted with this data set. No contamination was reported in this field-submitted blank.

IV. Laboratory Control Samples

Laboratory control samples prepared and analyzed with the samples for all three analysis parameters showed acceptable recoveries (Lab QC 85-115%), ranging from 98.0-101%.

V. Laboratory Duplicate Analysis

Sample GW08PB was analyzed in duplicate for TSS by the laboratory. Excellent reproducibility was demonstrated by these paired analyses, with a relative percent difference (RPD) of 5%.

No laboratory duplicate analyses were performed for chloride or ammonia on any of the samples in this data set.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD analyses were performed on sample GW08PB for ammonia and chloride. Recoveries for ammonia (98.5% and 98.8%) and chloride (92.3% and 93.5%) were acceptable and measured concentrations showed excellent reproducibility, with RPDs of 0.8% and 0.3%, respectively (QC 80-120% Recovery and \leq 20 RPD).

VII. Field Duplicates

Samples GW08PB and GW08DPPB were identified as a field duplicate pair. Positive paired results showed excellent reproducibility for chloride (5 RPD) and TSS (6 RPD). Ammonia was reported in GW08DPPB (0.28 μ g/L) but was not found above the reporting limit in GW08PB (0.10 μ g/L U). Based on this lack of confirmation at a significant concentration, results for ammonia in GW08PB and GW08DPPB were rejected (R) as unreliable.

VIII. Sample Results Verification

Results for TSS and chloride were correctly calculated and accurately reported for the samples in this data set based on review of the available raw data. Ammonia results were correctly



transcribed from the raw data; since only direct readings of the final results were documented, no verification of the reported results could be made by the validator.

All samples were analyzed at 5-fold dilutions for chloride. Therefore, the reporting limit (RL) for this parameter on the data tables in Attachment A was adjusted by the validator to reflect this dilution factor.

Sample results and RLs were reported to inconsistent significant figures and are not in accordance with previously-defined CompuChem policy, which states that values greater than 10 are reported to three significant figures and values less than 10 are reported to two significant figures. For consistency with historical data generated in support of this project, all results greater than or equal to 10 mg/L were adjusted to reflect three significant figures and values less than 10 mg/L (including RLs) were adjusted to reflect two significant figures, where necessary. Specifically, the following actions were taken:

- The positive results for ammonia in all samples were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.
- The positive results for TSS in GW03PB and GW04PB were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.
- RLs for ammonia and TSS were adjusted to reflect two significant figures (instead of three or four, as reported by the laboratory).

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation effort.

IX. Documentation

Three chain of custody (COC) records present in the data package included all reported samples. The following issues were noted:

- A copy of the courier airbill was not included in the data package to document the shipment portion of the sample transfers. The airbill number, however, was documented on each of the COC records.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should <u>not</u> be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been



provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are <u>laboratory-initiated quality control</u>; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

For ammonia, absorbance readings were provided for the IC standards but only direct readings of the final results were documented in the raw data for all runs performed during the sample analysis series. Therefore, the results reported for these analyses could not be verified by the validator. At the discretion of the data user, the laboratory may be requested to provide this documentation in future data packages prepared in support of this project.

The true values for chloride in the ion chromatography ICV/CCV standards were not documented in either wet chemistry data package applicable to this sampling effort. At the request of the validator with respect to the first wet chemistry package reviewed, these values were provided by the laboratory via facsimile on 7/7/03 (see Attachment C).

Some of these documentation issues could be problematic if the data were to be used in litigation.

X. Overall Assessment

Sample results for the three wet chemistry parameters were qualified or corrected as follows based on the validation effort:

- Results for ammonia in GW08PB and GW08DPPB were rejected (R) as unreliable based on lack of confirmation at a significant concentration in the field duplicate analyses.
- Results for ammonia in all samples were rounded to reflect two significant figures (instead of three significant figures, as reported by the laboratory).
- Results for TSS in GW03PB and GW04PB samples were rounded to reflect two significant figures (instead of three significant figures, as reported by the laboratory).
- RLs for ammonia and TSS were adjusted to reflect two significant figures (instead of three or four, as reported by the laboratory).

Documentation issues are discussed in Section IX.

This validation report should be considered <u>part of the data package</u> for all future distributions of the wet chemistry data.



ATTACHMENT A

DATA TABLES

Wet Chemistry - SDG No. RZ1067 April 2003 Sample Collections - Marion Bragg Landfill

Marion Bragg Landfill - April 2003 - Wet Chemistry Parameters in Ground Water

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Ammonia Chloride Total Suspended Solids	Collection Point Sample ID Lab Sample No. Collection Date
0.10 2.0 1.0	RL.
R 22.9 17.4	MB-1 GW08PB RZ1067-3 4/30/03
R 21.8 16.4	MB-1D GW08DPPB RZ1067-4 4/30/03
7.6 21.3 62.0	MB-2 GW07PB RZ1067-2 4/30/03
1.7 20.9 8.8	MB-5 GW03PB RZ1067-7 4/30/03
3.6 17.8 5.2	MB-6 GW04PB RZ1067-8 4/30/03
5.1 20.8 33.6	MB-7 GW05PB RZ1067-9 4/30/03
4.1 39.7 17.2	MB-8 GW06PB RZ1067-10 4/30/03
0.43 14.0 36.4	MB-9 GW02PB RZ1067-6 4/30/03

Marion Bragg Landfill - April 2003 - Wet Chemistry Parameters in Ground Water

Results are in mg/L			·
Collection Point Sample ID Lab Sample No. Collection Date	•	MB-10 GW01PB RZ1067-5 4/30/03	Field Blank GW09FBPB RZ1067-1 4/30/03
<u> </u>	RL		
Ammonia Chloride Total Suspended Solids	0.10 2.0 1.0	0.10 U 27.8 25.4	0.10 U 2.0 U 1.0 U



ATTACHMENT B

CLASSICAL CHEMISTRY ANALYSES DATA SHEETS (FORM Is)

Wet Chemistry - SDG No. RZ1067 April 2003 Sample Collections - Marion Bragg Landfill

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

5/5/03

Lab Name:	CompuChem		Contract:			[MB-1 GW	08PB	
Lab Code: LIBRTY		Case		NRAS No.:					
SDG No.:	RZ1067								
Matrix (so	oil/water): W	ATER		La	b Sam	ple I	D: RZ1067-	3	
Date Recei	ived: 5/1/03			*	Solid	s: 0	. 00		
	Concentra	ation Units (mg/	/L or mg/kg dry	weight	t) :	ng,	/L		
	PARAMETER		CONCENTRATION	С	Q	м	DATE ANALYZED]	
	TSS		17.4	i			5/5/03	Ō	
	Ammonia		R -0.100	 v			5/6/03	7	

Chloride

Caerikson 7/15/03

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

5/5/03

5/6/03

5/5/03

Lab Name:	CompuChem			Contract:			[MB-ID GWOBI	OPPB	
Lab Code:	LIBRTY		Case	No.:	NRAS No.:					
SDG No.:	RZ1067						,		•	
Matrix (so	oil/water):	WATER		_	La	b Sam	ple II	D: RZ1067-4		
Date Recei	Lved: 5/1/03	3			*	Solid	s: 0	.00		
	Concer	tration Un:	its (mg/L	or mg/kg dry	weight	=):	mg/	/L		
	PARAMET	ER	c	CONCENTRATION	С	Q	M	DATE ANALYZED		
	TSS		1	16.4				5/5/03]	

Ca£ 7/16/03

Ammonia

Chloride

16.4

21.8

-0.280

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: 9	compuChem			Contract:				MB-2 GN07PB			
Lab Code: <u>I</u>	IBRTY		Case No.:			NRAS No.:					
SDG No.: E	z1067										
Matrix (soil	L/water);	WATER			La	b Sam	ple I	D: RE1067-2			
Date Received: 5/1/03				% Solids: 0.00							
	Concen	tration Un	its (mg/	L or mg/kg dry	weight	t) :	ng,	/L			
	PARAMETI	I.R		CONCENTRATION	С	Ω	м	DATE ANALYZED			
	TSS			62.0				5/5/03			
	Ammonia			7.4 7-64				5/6/03			

Chloride

CAE7/15/03

Comments:		

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name:	CompuChem			Contract:				MB-5 GW03PB		
Lab Code:	LIBRTY		Case	No.:	NRAS No.:					
SDG No.:	RZ1067	•		-			•			
Matrix (soi	l/water):	VATER			La	b Sam	ple I	D: RZ1067-7	 -	
Date Receiv	red: 5/1/03				*	Solid	s: 0	.00		
	Concentr	ation Unit	s (mg/	L or mg/kg dry	weight	t) :	ng,	/L		
	PARAMETER			CONCENTRATION	С	Q	м	DATE ANALYZED		
	TSS			8.8 8.80	1			5/5/03		
	Ammonia			1.7 1.70	l		<u> </u>	5/6/03		

Chloride

Ca E 7/15/03

Comments:				
	 		•	4

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: Co	ompuChem			Contract:			[MB-L GW04PB		
Lab Code: L	IBRTY	-	Case No.:					IRAS No.:		
SDG No.: RE	Z1067									
Matrix (soil,	/water):	WATER			La	b Sam	ple II	D: RZ1067-8		
Date Received	d: <u>5/1/03</u>				*	Solid	<u>. 0</u>	.00		
	Concen	tration Uni	ts (mg/	L or mg/kg dry	weight	t):	mg/	'L		
	PARAMETE	R		CONCENTRATION	С	Q	м	DATE ANALYZED		
	TSS			5.2 5.20				5/5/03		
1	Ammonia			3.6 2.57				5/6/03		

Chloride

Ca 87/15/03

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: (CompuChem			Contract:				MB-7 GWO!	5 PB	
•	LIBRTY		Case No.: NRAS					S No.:		
SDG No.:	RZ1067									
Matrix (soi	1/water):	WATER		_	La	b Sam	ple I	D: RZ1067-9	·	
Date Receiv	ed: 5/1/03				8	Solid	s : <u>0</u>	. 00		
	Concen	tration U	nits (mg/	L or mg/kg dry	weight	t):	ng.	<u>/L</u>		
	PARAMETE	SR		CONCENTRATION	С	Ω	м	DATE ANALYZED		
	TSS			33.6	1			5/5/03	j	
	Ammonia			F 1 5-11-				5/6/02	1	

Chloride

COE 7/15/03

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name:	CompuChem		Cont	ract:			[MB-8 GM06PB			
Lab Code:	LIBRTY		Case No.:	se No.:			NRAS No.:				
SDG No.:	RZ1067										
Matrix (so	oil/water):	WATER			Lai	b Same	ple I	D: RE1067-10			
Date Recei	ved: 5/1/03		•	% Solids: 0.00							
	Concen	tration Un	its (mg/L or m	g/kg dry v	weight	.) :	mg/	/L			
	PARAMETE	:R	CONCE	ntration	С	Q	м	DATE ANALYZED			
	TSS		1	17.2				5/5/03			
	Ammonia		1	11 4 4 47-				F/C/02			

Chloride

CaE 7/15/03

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab :	Name :	CompuChem			Contract:				MB-9 GW021	?B
Lab	Code:	LIBRTY		Case No.: NRAS No.:						
SDG :	No.:	RZ1067						,		
Matr	ix (so	il/water):	WATER			La	b Sam	ple I	D: RZ1067-6	
Date	Recei	ved: 5/1/03				*	Solid	ls: 0	. 00	
		Concent	tration (Units (mg/	L or mg/kg dry	weight	t) :	mg,	/L	
		PARAME TE	R		CONCENTRATION	С	Ω	м	DATE ANALYZED	
		TSS			36.4	(5/5/03	
		Ammonia			0.43-0.434				5/6/03	

Chloride

CAE 7/15/03

Comments:				
				
		 		3

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: CompuChem			Contract:				GW01PB MB-10		
Lab Code:	LIBRTY		Case	No.:	NRAS No.:				
SDG No.:	RZ1067								
Matrix (soi	il/water):	WATER		- -	La	b Sam	ple I	D: RE1067-5	
Date Receiv	red: 5/1/03				*	Solid	s: 0	.00	
	Concen	tration (Jnits (mg/	L or mg/kg dry	weight	=):	ng,	<u>′L</u>	
	PARAMETE	R		CONCENTRATION	С	Q	м	DATE ANALYZED	
	TSS			25.4	1			5/5/03	
	Ammonia		1	0.10 9-100	ti			5/5/03	

Chloride

CaE7/15/03

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

5/5/03

Lab Name: CompuChem			Contract:			GWO9FBPB Field Blank		
Lab Code:	LIBRTY		Case No.:			NRAS No.:		
SDG No.:	RZ1067	<u> </u>						•
Matrix (so	il/water):	WATER			La	b Sam	ple I	D: RZ1067-1
Date Recei	ved: 5/1/03				*	Solid	s: <u>0</u>	. 00
	Concen	tration Uni	ts (mg/	L or mg/kg dry	weight	t):	ng,	/L
	PARAMETE	ir		CONCENTRATION	С	Ω	м	DATE ANALYZED
	TSS			1.0 1.00	Ü			5/5/03
	Ammonia		-	A 10 P-100	1 11			5/5/03

CaE415/03

Chloride



ATTACHMENT C

CHLORIDE TRUE VALUES, AS PROVIDED BY THE LABORATORY ON 7/7/03

Wet Chemistry - SDG No. RZ1067 April 2003 Sample Collections - Marion Bragg Landfill

True Values for IC Analysis

	<u>ICV</u>	LCSW	CCV	MS & MSD
Fluoride	2.50	2.500	2.50	5.00
Chloride	20.00	25.00	25.00	40.00
Nitrite	2.50	2.500	2.50	5.00
Bromide	2.50	2.500	2.50	5.00
Nitrate	2.50	2.500	2.50	5.00
Phosphate	2.50	2.500	2.50	5.00
Sulfate	20.00	50.00	50.00	40.00

501 Madison Avenue, Cary, North Carolina 27513 Phone: (919) 379-4005 p Fax: (919) 379-4050

> CompuChem Cary, North Carolina

Priority Memo

To: Carol Erichson	From: Rodney A. Raimonde					
	Pages with cover 2					
Fauc 865-966-8885	Date: 7/7/13					
Fax: 1844 Values	CCI					
☐ For Review ☐ Please Comment	☐ Please Roply	☐ Please Recycle				
Thank you,						
Rodney A. Raimonde 919-379-4018 (direct) 919-379-4040 (fax) rraimonde@compuchemlabs.com	3					

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DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

INORGANIC ANALYSIS DATA Dissolved Metals in Water

SDG No. RZ1067 Samples Collected April 2003

Chemical Analyses Performed by:

CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 5, 2003

92241/CAE/EKD MARION\Apr03\DMetals2



EXECUTIVE SUMMARY

Validation of the inorganics analysis data (dissolved metals) prepared by CompuChem Environmental for nine water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RZ1067, which was received for review on June 12, 2003. The following samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8) GW09FBPB (Field Blank)	GW02PB (MB-9)	GW01PB (MB-10)

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for thallium and zinc in all samples were qualified as estimated (UJ).
- Results for aluminum in GW02PB, GW03PB, GW04PB, GW06PB, GW01PB, and GW09FBPB were qualified as less than the reported values (U).
- The result for beryllium in GW09FBPB was qualified as less than the reported value (U).
- Results for cobalt in GW03PB, GW04PB, and GW06PB were qualified as less than the reported values (U).
- Results for iron and manganese in GW01PB were qualified as less than the reported values (U).
- Results for vanadium in GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U).
- Results for calcium, magnesium, and sodium in GW09FBPB were qualified as estimated (J, UJ).
- Results for chromium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U).
- The result for selenium in GW06PB was qualified as estimated (J).



- Results for potassium in all samples except GW09FBPB were qualified as estimated (J).
- Results for nickel in GW08PB, GW08DPPB, GW07PB, GW06PB, GW05PB, and GW01PB were qualified as estimated (J).
- Results for cobalt in GW08PB and GW07PB were qualified as estimated (J).
- The result for vanadium in GW08PB was qualified as estimated (J).

All "B," "N," and "E" flags applied by the laboratory were removed by the validator.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIII). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII of this report.

This validation report should be considered <u>part of the data package</u> for all future distributions of the inorganics data.



INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work ILM04.1. All target analytes (dissolved metals) were analyzed using trace ICP (inductively coupled plasma) and cold vapor atomic absorption (CVAA) instrumentation. Results of analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes denote specific information regarding the analytical results.

Trillium's validation was performed in accordance with the EPA "National Functional Guidelines for Inorganic Data Review" (EPA 540/R-94/013, 2/94). The EPA Region II Standard Operating Procedure (SOP) No. HW-2, (Revision XI), January 1992, "Evaluation of Metals Data for the Contract Laboratory Program (CLP)" was also used as guidance for the validation effort, and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the review, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by the National Functional Guidelines:

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- R The data are unusable. (Note: The analyte may or may not be present.)
- J The associated value is an estimated quantity.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables contained in Attachment A as well as on the Inorganic Analysis Data Sheets (Form Is) in Attachment B of this validation report to qualify the results as appropriate according to the review of the data package.



Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The ground water samples and field blank were collected on 4/30/03. All metals analyses were conducted on 5/8/03 and 5/9/03, well within acceptable holding times (28 days for mercury and six months for all other analytes).

Field filtration of the ground water samples for dissolved metals analysis was not clearly documented by the sampling team on the applicable chain of custody (COC) records. A "B" (for "both") was recorded on each COC in the field used to designate filtered or unfiltered; no clarification of what was filtered and unfiltered was documented. For the purposes of this validation effort, it was assumed that the appropriate sample containers for dissolved metals analysis were field-filtered prior to chemical preservation.

Chemical preservation of the ground water samples for dissolved metals analysis with nitric acid and ice was clearly documented on the COCs. Acceptable cooler temperatures (2-6°C) on laboratory receipt were recorded on all three COCs and on the laboratory's receiving logs. Acceptable sample pHs (<2) were also documented on the COCs as well as on on the applicable receiving and preparation logs. Therefore, successful sample preservation in the field was confirmed.

According to the data package narrative, all samples were received intact and in good condition.

II. Calibrations

Sample analyses for all Trace ICP target elements were performed in a single analysis series on 5/9/03 on an instrument identified as "P3." Mercury analyses were performed in a single CVAA series run on 5/8/03 on an instrument identified as "V3." A linearity check at the start of the CVAA series gave an acceptable correlation coefficient (>0.995). Initial and continuing calibration verification (ICV/CCV) standards were satisfactory for all metals reported from both applicable analysis series (90-110% for all ICP target analytes and 80-120% for mercury).

Contract required detection limit (CRDL) standards were run at regular intervals throughout the ICP analysis series; all applicable analytes were at the required concentrations (2xCRDL). Recoveries were acceptable (80-120%) in the three CRDL standards associated with the sample analyses except for zinc (69.6%, 71.0%, and 70.6%). Results for zinc in all samples were qualified as estimated (UJ) based on the unacceptably low CRDL standard recoveries.

A CRDL standard was also run at the start of the analysis series for mercury. The recovery for mercury in this standard was acceptable.



III. Blanks

No metals calibration blanks had values above the CRDLs or less than the negative CRDLs for any target element. However, responses above the applicable instrument detection limits (IDLs) were found for various combinations of nine different elements (aluminum, barium, beryllium, cadmium, chromium, cobalt, iron, magnesium, and vanadium) in each of the initial and continuing calibration blanks (ICB/CCBs); in addition, results for calcium and zinc were below the negative IDLs in many of the ICB/CCBs. Results for samples analyzed within five runs of an affected ICB/CCB warrant qualification if the sample result is less than five times the positive blank value or less than two times the absolute value of the negative blank value. The following sample results were qualified as less than the reported values (U) due to contamination in the associated calibration blanks:

- Aluminum in GW02PB, GW03PB, GW04PB, GW06PB, GW01PB, and GW09FBPB.
- Beryllium in GW09FBPB.
- Cobalt in GW03PB, GW04PB, and GW06PB.
- Iron in GW01PB.
- Vanadium in GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, and GW06PB.

The following sample results were qualified as estimated (J, UJ) based on negative responses in the associated calibration blanks:

- Calcium and magnesium in GW09FBPB.
- Zinc in all samples.

Sample results for all remaining elements for which positive or negative responses were found in the ICB/CCBs were not affected by the associated calibration blank values.

One preparation blank (PBW) was prepared and analyzed with the samples in this SDG. Responses for barium (0.30 μ g/L), calcium (-46.23 μ g/L), chromium (0.67 μ g/L), iron (31.88 μ g/L), manganese (0.98 μ g/L), and zinc (-2.29 μ g/L) were reported in the preparation blank. The following sample results were qualified as less than the reported values (U) based on associated preparation blank contamination:

- Chromium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB.
- Iron and manganese in GW01PB.



The following sample results were qualified as estimated (J, UJ) due to negative responses in the preparation blank:

- Calcium in GW09FBPB.
- Zinc in all samples.

Some of the actions warranted based on PBW responses are redundant with actions taken based on ICB/CCB results, no additional action was taken in these cases.

One field blank, GW09FBPB, was prepared in association with this data set. After qualifications based on laboratory blank contamination, magnesium (11.8 μ g/L) and sodium (536 μ g/L) were detected in this field-submitted blank. No sample results were affected by these field blank values.

IV. ICP Interference Check Sample

All interference check sample results were satisfactory (80-120 percent recovery).

V. Laboratory Control Sample

One laboratory control sample (LCS) was run for all ICP target analytes in association with this SDG. All laboratory control sample results for the ICP target analytes were satisfactory (80-120 percent recovery).

Based on the available documentation, no LCS samples were prepared or analyzed for mercury.

VI. Laboratory Duplicate Analysis

Duplicate analysis was performed on sample GW08PB for all target analytes. Relative percent differences (RPDs) between positive paired analytes in GW08PB and its duplicate were below the maximum acceptance limit of 20% for all elements detected at concentrations greater than five times the CRDL. For elements detected at concentrations less than five times the CRDL in the paired analyses, the difference between the paired results must be less than \pm CRDL. This criterion was met for all applicable target analytes.



VII. Matrix Spike Analysis

Matrix spike analysis was performed on sample GW08PB with acceptable recoveries (75-125%) for all target elements except selenium (131.3%) and thallium (64.8%). Results for thallium in all samples in this data set were qualified as estimated (UJ) based on the unacceptably low matrix spike recovery for this element. The result for selenium in GW06PB was qualified as estimated (J) based on the unacceptably high matrix spike recovery for this element. Selenium was not detected in any other samples in this data set, therefore no additional qualifiers were necessary based on the matrix spike results.

The "N" flags appropriately applied by the laboratory to all sample results for selenium and thallium were removed by the validator.

VIII. ICP Serial Dilution

Serial dilution analysis was performed on sample GW08PB. Results for elements with initial (undiluted) results greater than 50xIDL were acceptable (less than 10 percent difference) except for potassium (16.9%). Results for potassium in all samples except GW09FBPB were qualified as estimated (J) based on this serial dilution result.

The "E" flags appropriately applied by the laboratory to all sample results for potassium were removed by the validator.

IX. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. RPDs between positive paired results were acceptable (QAPP QC ≤25 RPD) for arsenic (8.0 RPD), barium (0.5 RPD), calcium (0 RPD), cobalt (0 RPD), iron (0.6 RPD), magnesium (0 RPD), manganese (0.1 RPD), potassium (0.4 RPD), sodium (0.7 RPD), and vanadium (4.4 RPD), but exceeded the QAPP-specified acceptance limit for nickel (42.6 RPD). Results for nickel in GW08PB and GW08DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

X. Sample Results Verification

Positive sample results were accurately reported from the raw data and IDLs established within three months prior to these sample analyses (on 4/15/03 for all ICP elements on P3 and for mercury on V3) were appropriately reported for those elements that were not detected.



Elevated %RSDs (>20%) among the triplicate measurements taken for each element in each run were found for numerous elements reported at concentrations just slightly above the applicable IDLs. Many of these results were subsequently qualified for reasons previously discussed; no additional action was necessary in these cases. Those sample results that were not so qualified were qualified by the validator as estimated (J) due to the high %RSDs; these values must be considered estimates based on the inconsistent responses obtained at the measured concentrations. The following results were qualified on this basis:

- Cobalt in GW08PB (23.5%) and GW07PB (26.8%).
- Nickel in GW07PB (26.0%) and GW06PB (33.2%).
- Vanadium in GW08PB (29.6%).
- Sodium in GW09FBPB (31.8%).

Positive sample results greater than the applicable IDLs but below the CRDLs were correctly reported by the laboratory with "B" qualifiers. As concentrations approach the IDL the accuracy of the measurement decreases; values closer to the CRDL, however, are probably quite accurate. Therefore, a guideline of 2xIDL was used to determine whether the reported results warranted qualification; specifically, sample results below the respective CRDL, less than 2xIDL and not otherwise qualified warrant qualification as estimated (J). Results for nickel in GW05PB and GW01PB were so qualified on this basis.

All "B" qualifiers applied by the laboratory were removed by the validator.

XL Other QC

Total metals analyses were not performed on these samples.

XII. Documentation

The three applicable chain of custody (COC) records were present in the data package and included all samples reported in this SDG. The following issues were noted:

 Copies of the courier airbills were not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on each COC record.



Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should <u>not</u> be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are <u>laboratory-initiated quality control</u>; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

These COC documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIII. Overall Assessment

Based on the validation effort, dissolved metals results for samples in SDG No. RZ1067 and were qualified as follows:

- Results for zinc in all samples were qualified as estimated (UJ) based on unacceptably low recoveries in the associated CRDL standards and due to negative responses in the associated calibration and preparation blanks.
- Results for aluminum in GW02PB, GW03PB, GW04PB, GW06PB, GW01PB, and GW09FBPB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.
- The result for beryllium in GW09FBPB was qualified as less than the reported value (U) based on contamination in the associated calibration blank.
- Results for cobalt in GW03PB, GW04PB, and GW06PB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.
- The result for iron in GW01PB was qualified as less than the reported value (U) based on contamination in the associated calibration and preparation blanks.
- Results for vanadium in GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.
- Results for calcium and magnesium in GW09FBPB were qualified as estimated (J, UJ) based on negative responses in the associated calibration blank. The result for calcium



in GW09FBPB was similarly qualified based on a negative response in the associated preparation blank.

- Results for chromium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U) based on contamination in the associated preparation blank.
- The result for manganese in GW01PB was qualified as less than the reported value (U) based on contamination in the associated preparation blank.
- Results for thallium in all samples in this data set were qualified as estimated (UJ) based on an unacceptably low matrix spike recovery for this element.
- The result for selenium in GW06PB was qualified as estimated (J) based on an unacceptably high matrix spike recovery for this element.
- Results for potassium in all samples except GW09FBPB were qualified as estimated (J) based on an unacceptable serial dilution result for this analyte.
- Results for nickel in GW08PB and GW08DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.
- Results for cobalt in GW08PB and GW07PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.
- Results for nickel in GW07PB and GW06PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.
- The result for vanadium in GW08PB was qualified as estimated (J) based on an elevated %RSD value among the triplicate ICP measurements.
- The result for sodium in GW09FBPB was qualified as estimated (J) based on an elevated %RSD value among the triplicate ICP measurements.
- Results for nickel in GW05PB and GW01PB were qualified as estimated (J) because they are less than 2x IDL and were not otherwise qualified.

All "B," "N," and "E" flags applied by the laboratory were removed by the validator.

Documentation issues observed in the data package are discussed in Section XII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the inorganics data.



ATTACHMENT A

DATA TABLES SDG No. RZ1067 Dissolved Metals in Water

Marion Bragg Landfill - April 2003 - Dissolved Metals in Ground Water and Surface Water Samples

All Results are in ug/L

All Results are	· · · · · · · · · · · · · · · · · · ·								
Collection Point		MB-1	MB-1D	MB-2	- MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID -		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No		RZ1067-3	RZ1067-4	RZ1067-2	RZ1067-7	RZ1067-8	RZ1067-9	RZ1067-10	RZ1067-6
Collection Date		4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03
	CRDL							=======================================	
Aluminum	200	40.9 U	40.9 U	40.9 U	57.9 U	45.3 U	40.9 U	64.8 U	52.7 U
Antimony	60	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Arsenic	10	6.0	6.5	77.7	33.4	122	64.1	118	6.2
Barium	200	192	191	627	365	410	540	248	68.6
Beryllium	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Cadmium	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Calcium	5000	119000	11900	167000	98200	121000	88900	92700	57000
Chromium	10	0.69 U	1.1 U	0.80 U	0.74 U	1.1 U	1.1 U	1.5 U	0.60 U
Cobalt	50	2.2 J	2.2	1.3 J	2.2 U	2.6 U	0.70 U	1.4 U	0.70 U
Copper	25	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Iron	100	1670	1660	26900	9410	16400	8300	10200	2210
Lead	3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Magnesium	5000	34000	34000	39200	54700	30200	31400	72500	21900
Manganese	15	928	927	266	184	79.2	67.4	109	488
Mercury	0.2	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	40	3.7 J	2.4 J	2.4 J	2.7	12.5	1.2 J	2.5 J	1.2 U
Potassium	5000	2330 J	2340 J	11100 J	3610 J	9010 J	12700 J	18500 J	1200 J
Selenium	5	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	3.1 J	2.3 U
Silver	10	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U
Sodium	5000	14500	14600	19100	26200	18800	37000	60700	10100
Thallium	10	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ
Vanadium	50	2.2 J	2.3	2.5	2.5 U	2.4 U	1.8 U	3.3 U	1.4 U
Zinc	20	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ

Marion Bragg Landfill - April 2003 - Dissolved Metals in Ground Water and Surface Water Samples

A	11	7	R	es	ul	ts	ar	e	in	u	٧/	\mathcal{L}
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All Nesulls ure	III ag/L	===	
Collection Point		MB-10	Field Blank
Sample ID ——		GW01PB	GW09FBPB
Lab Sample No.	===>	RZ1067-5	RZ1067-1
Collection Date.	===>	4/30/03	4/30/03
	CRDL		
Aluminum	200	42.4 U	43.9 U
Antimony	60	2.5 U	2.5 U
Arsenic	10	2.2 U	2.2 U
Barium	200	97.0	0.20 U
Beryllium	5	0.20 U	0.21 U
Cadmium	5	0.20 U	0.20 U
Calcium	5000	112000	15.7 UJ
Chromium	10	0.60 U	0.60 U
Cobalt	50	0.70 U	0.70 U
Copper	25	1.6 U	1.6 U
Iron	100	55.2 U	14.2 U
Lead	3	1.4 U	1.4 U
Magnesium	5000	35400	11.8 J
Manganese	15	3.0 U	0.20 U
Mercury	0.2	0.10 U	0.10 U
Nickel -	40	1.4 J	1.2 U
Potassium	5000	2190 J	28.6 U
Selenium	5	2.3 U	2.3 U
Silver	10	0.90 U	0.90 U
Sodium	5000	15500	536 J
Thallium	10	2.9 UJ	2.9 UJ
Vanadium	50	2.1 U	0.80 U
Zinc	20	1.5 UJ	1.5 UJ



ATTACHMENT B

INORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG No. RZ1067
Dissolved Metals in Water

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		MB-1 GWOSPB
Lab Name: COMPUCHEM	Contract:	
Lab Code: LIBRTY Case	No.: SAS No.:	SDG No.: RZ1067
Matrix (soil/water): WATER	Lab Sample ID:	RZ1067-3
Level (low/med): LOW	Date Received:	5/1/03
% Solids: 0.0		•

CAS No.	Analyte	Concentration	C	Q	м	
7429-90-5	Aluminum	40.9	U	1	P	Ī
7440-36-0	Antimony	2.5	טן	1	P	Ī
7440-38-2	Arsenic	6.0	B	T	P	
7440-39-3	Barium	192	P	T	P	1
7440-41-7	Beryllium	0.20	ט	1	P	1
7440-43-9	Cadmium	0.20	la		P]
7440-70-2	Calcium	119000			P]
7440-47-3	Chromium	0.69	B	TÜ	P	Ī
7440-48-4	Cobalt	2.2	厚	IJ	P	Ī
7440-50-8	Copper	1.6	ט		P]
7439~89-6	Iron	1670		1	P	Ī٠
7439-92-1	Lead	1.4	טן		P	<u>]</u> ;
7439-95-4	Magnesium	34000		1	P	1
7439-96-5	Manganese	928		<u> </u>	P	1
7439-97-6	Mercury	0.10	U	1	CV	ļ
7440-02-0	Nickel	3.7	B		P	
7440-09-7	Potassium	2330	B	KJ_	P	Į
7782-49-2	Selenium	2.3	ט	N.	P	1
7440-22-4	Silver	0.90	טן		P	Ī
7440-23-5	Sodium	14500	1_	1	P	֧ׅׅׅ֚֚֚֚֓֞֞֞֞֝֟֝֝֝֝֝֟֝֓֓֓֓֓֓֟֝֓֓֓֓֓֡֝֡֝֓֓֓֓֡֝֡֡֝֡֡֝֡֡֝֡֡֝֡֡֝
7440-28-0	Thallium	2.9	N	IX UJ	P]
7440-62-2	Vanadium	2.2	B	IJ	P] }
7440-66-6	Zinc	1.5	17	145	₽	15

Color Before	: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After:	COLORLESS	Clarity After:	CLEAR	Artifacts:	
Comments:	DISSOLVED	- 4			
					. =
					4

U. S. EPA-CLP -1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

			MB-ID	GW08DPPB	
Lab Name:	COMPUCHEM	 Contract:			

Lab Code: LIBR	TY Case No.:	8 <i>i</i>	AS No.:		SDG N	o.:	RZ1067
Matrix (soil/wa	ter): WATER		Lab Sample I	D:	RZ106	7-4	
Level (low/med)	: LOW		Date Receive	d:	5/1/0	3	•
% Solids: 0.0		ion Units (ug	/L or mg/kg dry			-	L
	VVIII-022		2 01 29,	,	,, .		
	CAS No.	Analyte	Concentration	С	Ω	М	
	7429-90-5	Aluminum	40.9	U		₽	ja ja
	7440-36-0	Antimony	2.5	ט		P	78
	7440-38-2	Arsenic	6.5	B		P	Ī
	7440-39-3	Barium	191	B]	P	ī /
	7440-41-7	Beryllium	0.20	ט	1	P]
	7440-43-9	Cadmium	0.20	ט	1	P	1 \
	7440-70-2	Calcium	119000			P	Ī
	7440-47-3	Chromium	1.1	B	lu	P	
	7440-48-4	Cobalt		P	1	P	41
	7440-50-8	Copper	1.6	טן		R	1
	7439-89-6	Iron	1660	Ī		P	Ī (
	7439-92-1	Lead	1.4	טן	l	P	Ī \
	7439-95-4	Magnesium	34000	1	1	P	1
	7439-96-5	Manganese	927	1	1	P	Ī
	7439-97-6	Mercury	0.10	ט		CV	<u> </u>
	7440-02-0	Nickel	2.4	B	IJ	P	Īţ
	7440-09-7	Potassium	2340	178	FJ	P] \
	7782-49-2	Selenium	2.3	ľσ	jyl	P	<u> </u>
	7440-22-4	Silver	0.90	שן	 	P	<u> </u>
	7440-23-5	Sodium	14600		1	P	1568 1568
	7440-28-0	Thallium	•	V.	YUJ	P	[, ∕
	7440-62-2	Vanadium	2.3			P	Ž
	7440-66-6	Zinc	1.5	17	MJ	P	Īå
Color Before:	COLORLESS C1	arity Before:	CLEAR	Te	exture	٠.	
Color After:	COLORLESS C1:	arity After:	CLEAR	Ar	tifact	:8:	

Comments:

DISSOLVED

U. S. EPA-CLP -1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-2	GW07PB	

		MB-X
Lab Name: COMPUCHEM	Contract:	
Lab Code: LIBRTY Case No.:	SAS No.:	SDG No.: RZ1067
Matrix (soil/water): WATER	Lab Sample ID:	RZ1067-2
Level (low/med): LOW	Date Received:	5/1/03
% Solids: 0.0		i

CAS No.	Analyte	Concentration	С	Q	м	
7429-90-5	Aluminum	40.9	U	†	P	Ί.,
7440-36-0	Antimony	2.5	lα	l	P	Z Z
7440-38-2	Arsenio	77.7	1	1	P	
7440-39-3	Barium	627	Ī	1	P	Ī /
7440-41-7	Beryllium	0.20	שן	1	P]
7440-43-9	Cadmium	0.20	ט		P]
7440-70-2	Calcium	167000		1	P	
7440-47-3	Chromium	0.80	B	lu	₽] \
7440-48-4	Cobalt	1.3	B	IJ	P	
7440-50-8	Copper	1.6	טן	1	P	13
7439-89-6	Iron	26900	1	1	P	[%]
7439-92-1	Lead	1.4	U	1	P] ``
7439-95-4	Magnesium	39200	1	1	P	
7439-96-5	Manganese	266	1		P]
7439-97-6	Mercury	0.10	U	Ī	cv	1
7440-02-0	Nickel	2.4	B	IJ	P	Ī
7440-09-7	Potassium	11100	Ī	罗丁	P	Ī
7782-49-2	Selenium	2.3	מן	M	P	<u> </u>
7440-22-4	Silver	0.90	Ū		P	15
7440-23-5	Sodium	19100	Ī.		P	12 KS 0
7440-28-0	Thallium	2.9	17	VUJ	P	150
7440-62-2	Vanadium	2.5	P		P	
7440-66-6	Zinc	1.5	177	IUJ	P	B

Color Befor	e: COLORLESS	Clarity Before:	CLEAR	Texture:		_
Color After	: COLORLESS	Clarity After:	CLEAR	Artifacts:		
Comments:	DISSOLVED					
					15	

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

			_
MB-5	GW	3PB	

			MB-5
Lab Name:	COMPUCHEM	Contract:	
Lab Code:	LIBRTY Case No.:	_ SAS No.:	SDG No.: RZ1067
Matrix (so:	il/water): WATER	Lab Sample ID:	RZ1067-7
Level (low,	/med): LOW	Date Received:	5/1/03

% Solids: 0.0 ____

CAS No.	Analyte	Concentration	С	Q	М	"
7429-90-5	Aluminum	57.9	F	u	P	189
7440-36-0	Antimony	2.5	U	Ī	P	Ī
7440-38-2	Arsenic	33.4	T	1	P	1
7440-39-3	Barium	365	Π	1	P	٦ /
7440-41-7	Beryllium	0.20	ַ		P	7 /
7440-43-9	Cadmium	0.20	U	1	P	Ī
7440-70-2	Calcium	98200	Ι,		P	Ī
7440-47-3	Chromium	0.74	B	lu	P	Ī \
7440-48-4	Cobalt	2.2	F	lu	P	٦,
7440-50-8	Copper	1.6	U		P	7/5/02
7439-89-6	Iron	9410	T	1	P]%
7439-92-1	Lead	1.4	ט	1	P	Ī ,
7439-95-4	Magnesium	54700	T	1	P	11
7439-96-5	Manganese	184			P	1
7439-97-6	Mercury	0.10	שׁ	1	CV	1
7440-02-0	Nickel	2.7	18,	1	P	Ī١
7440-09-7	Potassium	3610	F	KJ	P] \
7782-49-2	Selenium	2.3	Ü	[]	P	Ī
7440-22-4	Silver	0.90	שן		P	۶ آ
7440-23-5	Sodium	26200	Ι,	1	P	1489
7440-28-0	Thallium	2.9	14	VUJ	P	ĺΧ
7440-62-2	Vanadium	2.5	更	lu	P	E
7440-66-6	Zinc	1.5	V	IUJ	P	18

Color Before	: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After:	COLORLESS	Clarity After:	CLEAR	Artifacts: _	
Comments:	DISSOLVED				

U. S. EPA-CLP -1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: COMPUCHEM	Contract:	MB-6
Lab Code: LIBRTY Case No.:	SAS No.:	SDG No.: RZ1067
Matrix (soil/water): WATER	_ Lab Sample ID:	RZ1067-8
Level (low/med): LOW	Date Received:	5/1/03
1 0-1:d 0 0		

% Solids: 0.0

CAS No.	Analyte	Concentration	С	Ω	М]
7429-90-5	Aluminum	45.3	13	l u	P	12/2
7440-36-0	Antimony	2.5	Ĭσ	j	P	
7440-38-2	Arsenic	122	Ī		P	<u> </u>
7440-39-3	Barium	410	Π		P	1
7440-41-7	Beryllium	0.20	Ū		P	ī
7440-43-9	Cadmium	0.20	טן	1	P	ī \
7440-70-2	Calcium	121000	Π	1	P] \
7440-47-3	Chromium	1.1	B	lu	P	1 00
7440-48-4	Cobalt	2.6	P	lu	P	1/2
7440-50-8	Copper	1.6	טן	1	P	1%
7439-89-6	Iron	16400	Ì	1	P	Ī,
7439-92-1	Lead	1.4	טן		P] [
7439-95-4	Magnesium	30200			P]
7439-96-5	Manganese	79.2	1	1	P]
7439-97-6	Mercury	0.10	lo,	1	CV	1
7440-02-0	Nickel	12.5	JB]	P] [
7440-09-7	Potassium	9010		FJ	P] [
7782-49-2	Selenium	2.3	U	X	P	Ī
7440-22-4	Silver	0.90	טן		P	ĺΫ
7440-23-5	Sodium	18800	1	1	P	21
7440-28-0	Thallium	2.9	p _	MUJ	P	£4/80
7440-62-2	Vanadium	2.4	B	IU	P	
7440-66-6	Zinc	1.5	W/	IUJ	P	B

Color Before	e: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After	: COLORLESS	Clarity After:	CLEAR	Artifacts:	
Comments:	DISSOLVED				
					10
					14

U. S. EPA-CLP -1-

INORGANIC ANALYSES DATA SHEET

	EPA	SAMPLE	NO.	
ua.	.7	GW05PB		

Lab Name: COMPUCH	em	Contro	act:		
Lab Code: LIBRTY	Case No.:	SA	S No.:	SDG No.:	RZ1067
Matrix (soil/water): WATER		Lab Sample ID:	RZ1067-9	
Level (low/med):	LOW		Date Received:	5/1/03	
% Solids: 0.0				•	
, porrag. 0.0	_				•
	Concentrat	ion Units (ug/1	L or mg/kg dry wes	ight): UG/	<u>'L</u>
	CAS No.	Analyte	Concentration C	O M	
	7429-90-5	Aluminum	40.9 U	P	<u> </u>
1	7440-36-0	Antimony	2.5 0	P	
	7440-38-2	Arsenic	64.1	P] }
	7440-39-3	Barium	540	P	11
	7440-41-7	Beryllium	0.20	P	<u> </u>
	7440-43-9	Cadmium	0.20	P	<u> </u>
	7440-70-2	Calcium	88900	P] \
	7440-47-3	Chromium	1.1	U P	<u> </u>
•	7440-48-4	Cobalt	0.70	P	<u> </u>
	7440-50-8	Copper	1.6 0	P	7/5/43
	7439-89-6	Iron	8300	P	[A [
	7439-92-1	Lead	1.4 0	P] \
	7439-95-4	Magnesium	31400	P	1
	7439-96-5	Manganese	67.4	P]
	7439-97-6	Mercury	0.10	cv	
	7440-02-0	Nickel	1.2	1 J P	7 \
	7440-09-7	Potassium	12700	KJ 12	J (
	7782-49-2	Selenium	2.3 0	P	1
	7440-22-4	Silver	0.90 U	P] >
	7440-23-5	Sodium	37000	P	
	7440-28-0	Thallium	2.9		1 × 1
	7440-62-2	Vanadium	1.8 🗗	14 P	
	7440-66-6	Zinc	1.5	IUJ P	[2
Color Before: CO	CORLESS C1	arity Before:	CLEAR 1	Cexture:	
Color After: COI	ORLESS Cla	arity After:	CLEAR A	rtifacts:	
Comments: DISSO	LVED				

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

			MB-8 GHOSE
Lab Name:	COMPUCHEM	Contract:	
Lab Code:	LIBRTY Case No.:	SAS No.:	SDG No.: RZ1067
Matrix (so	il/water): WATER	Lab Sample ID:	RZ1067-10
Level (low,	/med): LOW	Date Received:	5/1/03

% Solids: 0.0

CAS No.	Analyte	Concentration	С	Q	М	w
7429-90-5	Aluminum	64.8	13	u	P	10-
7440-36-0	Antimony	2.5	TU	1	P	
7440-38-2	Arsenic	118	Ī		P	1
7440-39-3	Barium	248	Ī		P] [
7440-41-7	Beryllium	0.20	ש		P]
7440-43-9	Cadmium	0.20	U	1	P	ĪΙ
7440-70-2	Calcium	92700	Ι.		P	Ī١
7440-47-3	Chronium	1.5	V.	IU	P	\int_{0}^{∞}
7440-48-4	Cobalt	1.4	F	TU	P	10
7440-50-8	Copper	1.6	טן		P	12
7439-89-6	Iron	10200			P	Ī ```
7439-92-1	Lead	1.4	U	1	P	1
7439-95-4	Magnesium	72500	Ī		P	17
7439-96-5	Manganese	109			P	i /
7439-97-6	Mercury	0.10	ַט]	[·	CV	Ì /
7440-02-0	Nickel	2.5	B	IJ	P	i l
7440-09-7	Potassium	18500	T.	FJ	P	i (
7782-49-2	Selenium	3.1	P	MJ	P	Ī `
7440-22-4	Silver	0.90	U	1	P	į 2
7440-23-5	Sodium	60700	Π,	1	P	Extron
7440-28-0	Thallium	2.9	17	VUJ	P	الجُ
7440-62-2	Vanadium	3.3	B	u	P	ठि
7440-66-6	Zino	1.5	W	14.7	P	8

Color Befor	e: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After	: COLORLESS	Clarity After:	CLEAR	Artifacts:	
Comments:	DISSOLVED				
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U. S. EPA-CLP -1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

	-	FA	STATE	110.
M	g - (7	GW02PB	

						1/4	16-9	
Lab Name:	COMPUCHE	Ą	Contra	ct:				
Lab Code:	LIBRTY	Case No.:	SAS	No.:		SDG N	o.:	RZ1067
Matrix (soi	il/water)	: WATER		Lab Sample II) :	RZ106	7-6	
Level (low/	/med):	LOW		Date Received	1:	5/1/0	3	•
% Solids:	0.0							
		Concentrati	ion Units (ug/L	or mg/kg dry	re ig	ght):	UG/1	<u>.</u>
		CAS No.	Analyte	Concentration	С	Ω	м	w
		7429-90-5	Aluminum	52.7	声	u	P	8
	į	7440-36-0	Antimony	2.5	U		P	<u> </u>
	j	7440-38-2	Arsenic	6.2	B,		P	
	į	7440-39-3	Barium	68.6	P		P	
	ĺ	7440-41-7	Beryllium	0.20	ט		P	
		7440-43-9	Cadmium	0.20	ַט	<u> </u>	P	
	ĺ	7440-70-2	Calcium	57000	<u> </u>		P	\
	j	7440-47-3	Chromium	0.60	ָע	J	P	<i>m</i>
		7440-48-4	Cobalt	0.70	U	†	P	1/2
	[7440-50-8	Copper	1.6	U	ļ <u> </u>	P,	6
	Į	7439-89-6	Iron	2210		1	P	
	<u>[</u>	7439-92-1	Lead	1.4	ט		P	
	ĺ	7439-95-4	Magnesium	21900		<u> </u>	P	<u> </u>
		7439-96-5	Manganese	488		<u> </u>	P	
	Į	7439-97-6	Mercury		מ	<u> </u>	cv	!
	Į	7440-02-0	Nickel		ען		P	
	Į	7440-09-7	Potassium	1200	J	r J	P	! (
	L	7782-49-2	Selenium			x	P	! `
	Į	7440-22-4	Silver	0.90	ַ		P	j
	Ţ	7440-23-5	Sodium	10100			P	\$
	Ĺ	7440-28-0	Thallium			*UJ	P	×
	Ĺ	7440-62-2	Vanadium	1.4	ø	u	P	3
	Ĺ	7440-66-6	Zinc	1.5	y	UJ	P	CAEUKSON

Color Before	e: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After	: COLORLESS	Clarity After:	CLEAR	Artifacts:	
Comments:	DISSOLVED			· · · · · · · · · · · · · · · · · · ·	
					10

U. S. EPA-CLP -1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-10	GW01PB	

			$MD^{-1}U$
Lab Name:	COMPUCHEM	Contract:	
Lab Code:	LIBRTY Case No.:	SAS No.:	SDG No.: RZ1067
Matrix (so	il/water): WATER	Lab Sample ID:	RZ1067-5
Level (low	/med): LOW	Date Received:	5/1/03
% Solids:	0.0		1

CAS No.	Analyte	Concentration	С	Ω	м	w
7429-90-5	Aluminum	42.4	1	u	P	ğ
7440-36-0	Antimony	2.5	Ŭ		P	iγ
7440-38-2	Arsenic	2.2	שן	1	P] }
7440-39-3	Barium	97.0	B		P	i
7440-41-7	Beryllium	0.20	טן	T	P]
7440-43-9	Cadmium	0.20	U	<u> </u>	P	<u> </u>
7440-70-2	Calcium	112000			P	1
7440-47-3	Chromium	0.60	U	1	P	Ì
7440-48-4	Cobalt	0.70	ט	1	P	[3
7440-50-8	Copper	1.6	D.	1	P	1/2/4
7439-89-6	Iron	55.2	F	14	P	in
7439-92-1	Lead	1.4	טן	1	P	i \
7439-95-4	Magnesium	35400	T,	1	P	j
7439-96-5	Manganese	3.0	F	TU	P	i /
7439-97-6	Mercury	0.10	ט	1	CV	ì /
7440-02-0	Nickel	1.4	B	TJ	P	i l
7440-09-7	Potassium	2190	F	K J	P	<i> </i>
7782-49-2	Selenium	2.3	ט)3V	P	ĺ
7440-22-4	Silver	0.90	U	1	P	3
7440-23-5	Sodium	15500	Ī.	1	P	8, i
7440-28-0	Thallium	2.9	17	XUJ	P	عجزا
7440-62-2	Vanadium	2.1	F	14	P	asuitson
7440-66-6	Zinc	1.5	V	WJ	P	2

Color After	: COLORLESS	Clarity After:	CLEAR	Artifacts:	
Comments:	DISSOLVED				

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		FB GWOSFBPB
Lab Name: COMPUCHEM	Contract:	
Lab Code: LIBRTY Case No.:	SAS No.:	SDG No.: RZ1067
Matrix (soil/water): WATER	Lab Sample ID:	RZ1067-1
Level (low/med): LOW	Date Received:	5/1/03
% Solids: 0.0		

CAS No.	Analyte	Concentration	C	0	м	İ
				_		w
7429-90-5	Aluminum	43.9	F	И	P	B
7440-36-0	Antimony	2.5	ט		P	'
7440-38-2	Arsenic	2.2	U	Ì	P	j
7440-39-3	Barium	0.20	U	1	P	
7440-41-7	Beryllium	0.21	F	14	P	i /
7440-43-9	Cadmium	0.20	U.	1	P	
7440-70-2	Calcium	15.7	17	IUJ	P	
7440-47-3	Chronium	0.60	טן	1	P	1
7440-48-4	Cobalt	0.70	U		P	1 00
7440-50-8	Copper	1.6	Ü	1	P	4/5/03
7439-89-6	Iron	14.2	טן	1	P	12
7439-92-1	Lead	1.4	שׁ	1	P	1
7439-95-4	Magnesium	11.8	F	J	P	i (
7439-96-5	Manganese	0.20	U		P.	i }
7439-97-6	Mercury	0.10	U	1	CV	1
7440-02-0	Nickel	1.2	טן	1	P	
7440-09-7	Potassium	28.6	ט	J.	P	
7782-49-2	Selenium	2.3	U	 ¥	P	`
7440-22-4	Silver	0.90	ט	<u> </u>	P	7
7440-23-5	Sodium	536	F	IJ	P	22
7440-28-0	Thallium	2.9	7	ZU Y	P	aruken
7440-62-2	Vanadium	0.80	ט		P	な
7440-66-6	Zinc	1.5	Y	UJ	P	à

Color Before	e: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After:	COLORLESS	Clarity After:	CLEAR	Artifacts:	
Comments:	DISSOLVED				
					40



DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

INORGANIC ANALYSIS DATA
Dissolved Metals in Water

SDG No. RX1067 Samples Collected April 2003

Chemical Analyses Performed by:

CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 3, 2003

92241/CAE/PSN MARION\Apr03\DMetab1



EXECUTIVE SUMMARY

Validation of the inorganics analysis data (dissolved metals) prepared by CompuChem Environmental for five surface water samples from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RX1067, which was received for review on June 12, 2003. The following samples were reported:

PW01PB (PW-1)	SW01PB (SW-1)	SW01DPPB (SW-1D)
SW02PB (SW-5)	SW03PB (SW-6)	,

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for arsenic and thallium in all site samples were qualified as estimated (UJ).
- Results for chromium in SW02PB, SW03PB, and PW01PB were qualified as estimated (UJ).
- Results for cobalt in PW01PB and SW03PB were qualified as less than the reported values (U).
- Results for nickel in all samples were qualified as less than the reported values (U).
- Results for cadmium in SW01DPPB, SW02PB, and SW03PB were qualified as estimated (UJ).
- Results for cadmium and selenium in SW01PB were qualified as less than the CRDLs (5.0 U).
- Results for copper and vanadium in SW01DPPB were qualified as less than the CRDLs (25.0 U, and 50.0 U, respectively).
- Results for lead in SW01PB and SW01DPPB were rejected (R).
- The result for copper in PW01PB was qualified as estimated (J).

All "B" flags applied by the laboratory were removed by the validator.



Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIII). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII of this report.

This validation report should be considered <u>part of the data package</u> for all future distributions of the inorganics data.



INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work ILM04.1. All target analytes (dissolved metals) were analyzed using trace ICP (inductively coupled plasma) and cold vapor atomic absorption (CVAA) instrumentation. Results of analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes denote specific information regarding the analytical results.

Trillium's validation was performed in accordance with the EPA "National Functional Guidelines for Inorganic Data Review" (EPA 540/R-94/013, 2/94). The EPA Region II Standard Operating Procedure (SOP) No. HW-2, (Revision XI), January 1992, "Evaluation of Metals Data for the Contract Laboratory Program (CLP)" was also used as guidance for the validation effort, and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the review, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by the National Functional Guidelines:

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- R The data are unusable. (Note: The analyte may or may not be present.)
- J The associated value is an estimated quantity.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables contained in Attachment A as well as on the Inorganic Analysis Data Sheets (Form Is) in Attachment B of this validation report to qualify the results as appropriate according to the review of the data packages.



Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The surface water samples were collected on 4/29/03. All metals analyses were conducted on 5/7/03 and 5/8/03, well within acceptable holding times (28 days for mercury and six months for all other analytes).

Field filtration of the surface water samples for dissolved metals analysis was not clearly documented by the sampling team on the applicable chain of custody (COC) record. A "B" (for "both") was recorded in the COC field used to designate filtered or unfiltered; no clarification of what was filtered and unfiltered was documented. For the purposes of this validation effort, it was assumed that the appropriate sample containers for dissolved metals analysis were field-filtered prior to chemical preservation.

Chemical preservation of the samples for dissolved metals analysis with nitric acid and ice was clearly documented on the COC. Acceptable cooler temperatures (2-6°C) on laboratory receipt were recorded on the COC and on the laboratory's receiving log. Acceptable sample pHs (<2) were also documented on the COC as well as on the applicable receiving and preparation logs. Therefore, successful sample preservation in the field was confirmed.

According to the narrative in the data package, all samples were received intact and in good condition.

II. Calibrations

Sample analyses for all Trace ICP target elements were performed in a single analysis series on 5/7/03 on an instrument identified as "P4." Mercury analyses were performed in a single CVAA series run on 5/8/03 on an instrument identified as "V3." A linearity check at the start of the CVAA series gave an acceptable correlation coefficient (>0.995). Initial and continuing calibration verification (ICV/CCV) standards were satisfactory for all metals reported from both applicable analysis series (90-110% for all ICP target analytes and 80-120% for mercury).

Contract required detection limit (CRDL) standards were run at regular intervals throughout the ICP analysis series; all applicable analytes were at the required concentrations (2xCRDL). In the CRDL standards bracketing the site sample analyses, recoveries were acceptable (80-120%) except for thallium (46.7% and 75.0%), zinc (79.9% and 79.6%), and selenium (133.5% in the ending CRDL standard).

Results for thallium in all site samples were qualified as estimated (UJ) based on the unacceptably low CRDL standard recoveries. The result for selenium in SW01PB was qualified as estimated (J) based on the unacceptably high CRDL standard recovery. No other positive results were reported for selenium, and the high recovery suggests the potential for reporting false positives or



positive results that are biased high; therefore, no further action was taken with regard to this analyte. Both CRDL standard recoveries for zinc round to 80%; based on professional judgment, no action was taken based on the slightly low CRDL standard recoveries for this analyte.

A CRDL standard was also run at the start of the analysis series for mercury. The recovery for mercury in this standard was acceptable.

III. Blanks

No metals calibration blanks had values above the CRDLs or less than the negative CRDLs for any target element. However, responses above the applicable instrument detection limits (IDLs) were found for various combinations of 10 different elements (aluminum, barium, beryllium, cobalt, iron, magnesium, nickel, potassium, sodium, and silver) in each of the initial and continuing calibration blanks (ICB/CCBs). In addition, results for one or more of three elements (arsenic, chromium, and thallium) that were below the negative IDLs were also reported in one or more of the ICB/CCBs. Results for samples analyzed within five runs of an affected ICB/CCB warrant qualification if the sample result is less than five times the positive blank value or less than two times the absolute value of the negative blank response.

Results for thallium in all samples and for chromium in SW02PB, SW03PB, and PW01PB were qualified as estimated (UJ) based on negative responses in the associated calibration blanks.

Sample results for all remaining elements for which positive or negative responses were found in the ICB/CCBs were not affected by the associated calibration blank values.

One preparation blank (PBW) was prepared and analyzed with the samples in this SDG. Responses for arsenic (-4.66 μ g/L), barium (0.32 μ g/L), cadmium (-0.43 μ g/L), cobalt (0.93 μ g/L), magnesium (62.80 μ g/L), nickel (1.94 μ g/L), and potassium (209.72 μ g/L) were reported in the preparation blank. All sample results for barium, magnesium, and potassium were greater than the applicable action limit for qualification based on the blank responses for these analytes; therefore no sample results for these three analytes were qualified on this basis. Results for cobalt in PW01PB and SW03PB and for nickel in all samples were qualified as less than the reported values (U) due to the associated PBW contamination. Results for arsenic in all samples and for cadmium in SW01PB, SW01PPB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the PBW.

Some of the actions warranted based on PBW responses are redundant with actions taken based on CCB results; no additional action was taken in these cases.

No field-submitted blanks were associated with these samples.



IV. ICP Interference Check Sample

All interference check sample results were satisfactory (80-120 percent recovery) with the exception of lead (79.6%) in the series-ending check sample. Since this value rounds to 80% and since none of the interfering elements (aluminum, calcium, iron, and magnesium) was present at a high concentration in the site samples, no action was taken by the validator on this basis.

V. Laboratory Control Sample

One laboratory control sample (LCS) was run for all ICP target analytes in association with this SDG. All laboratory control sample results for the ICP target analytes were satisfactory (80-120 percent recovery).

Based on the available documentation, no LCS samples were prepared or analyzed for mercury.

VI. Laboratory Duplicate Analysis

Duplicate analysis was performed on sample SW01PB for all target analytes. Relative percent differences (RPDs) between positive paired analytes in SW01PB and its duplicate were below the maximum acceptance limit of 20% for all elements detected at concentrations greater than five times the CRDL. For elements detected at concentrations less than five times the CRDL in both of the paired analyses, the difference between the paired results must be less than ±CRDL. This criterion was met for all applicable target analytes.

Positive results below the CRDL for cadmium $(0.52 \,\mu g/L)$ and selenium $(4.24 \,\mu g/L)$ were reported in the original analysis of SW01PB but were not confirmed in the duplicate analysis $(0.40 \, \text{U})$ and $(0.52 \, \mu g/L)$ cadmium and selenium were also not detected in the field duplicate of SW01PB (SW01DPPB; see Section IX). Based on professional judgment, results for cadmium and selenium in SW01PB were qualified as less than the CRDLs $(0.50 \, \text{U})$ in both cases) due to lack of confirmation in the laboratory duplicate analyses.

VII. Matrix Spike Analysis

Matrix spike analysis was performed on sample SW01PB with acceptable recoveries (75-125%) for all target elements.



VIII. ICP Serial Dilution

Serial dilution analysis was performed on samples SW01PB. Results for elements with initial (undiluted) results greater than 50xIDL were acceptable (less than 10 percent difference).

IX. Field Duplicates

Sample SW01DPPB was identified as a field duplicate of SW01PB. RPDs between positive paired results were acceptable (QAPP QC ≤25 RPD) for barium (0.3 RPD), calcium (0.3 RPD), magnesium (0.6 RPD), manganese (1.5 RPD), potassium (0.8 RPD), and sodium (0.5 RPD).

Positive results below the CRDLs for cadmium (0.52 μ g/L) and selenium (4.2 μ g/L) were reported in SW01PB but were not confirmed in SW01DPPB (0.40 U and 2.6 U, respectively). Similarly, results below the CRDL for copper (2.6 μ g/L) and vanadium (1.3 μ g/L) were reported in SW01DPPB but was not confirmed in SW01PB (2.3 U and 1.0 U, respectively). Based on professional judgment, results for cadmium and selenium in SW01PB and for copper and vanadium in SW01DPPB were qualified as less than the CRDLs (5.0 U, 5.0 U, 25.0 U, and 50.0 U, respectively) due to lack of field duplicate confirmation at low concentrations.

Lead was reported above the CRDL in SW01DPPB (3.7 μ g/L) but was not detected above the IDL in SW01PB (2.7 U). Results for lead in SW01PB and SW01DPPB were rejected (R) as unreliable based on this lack of confirmation at a significant concentration.

X. Sample Results Verification

Positive sample results were accurately reported from the raw data and IDLs established within three months prior to these sample analyses (on 4/15/03 for all ICP elements on P4 and for mercury on V3) were appropriately reported for those elements that were not detected.

Elevated %RSDs (>20%) among the triplicate measurements taken for each element in each run were found for numerous elements reported at concentrations below the applicable CRDLs. Most of these results were subsequently qualified for reasons previously discussed; no additional action was necessary in these cases. Those sample results that were not so qualified were qualified by the validator as estimated (J) due to the high %RSDs; these values must be considered estimates based on the inconsistent responses obtained at the measured concentrations. The result for copper in PW01PB was so qualified on this basis.

Positive sample results greater than the applicable IDLs but below the CRDLs were correctly reported by the laboratory with "B" qualifiers. As concentrations approach the IDL the accuracy of the measurement decreases; values closer to the CRDL, however, are probably quite accurate.



Therefore, a guideline of 2xIDL was used to determine whether the reported results warranted qualification; specifically, sample results below the respective CRDL, less than 2xIDL and not otherwise qualified warrant qualification as estimated (J). No sample results warranted qualification on this basis.

All "B" qualifiers applied by the laboratory were removed by the validator.

XI. Other QC

Total metals analyses were not performed on these samples.

XII. Documentation

The applicable chain of custody (COC) record was present in the data package. The following issues were noted:

- A copy of the courier airbill was not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on the COC record.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should <u>not</u> be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are <u>laboratory-initiated quality control</u>; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

These COC documentation issues do not affect the technical validity of the data generated for these samples, however they could be problematic if the data were to be used in litigation.

XIII. Overall Assessment

Based on the validation effort, dissolved metals results for samples in SDG No. RX1067 were qualified as follows:



- Results for thallium in all site samples were qualified as estimated (UJ) based on unacceptably low recoveries in the associated CRDL standards and negative responses in the associated calibration blanks.
- Results for chromium in SW02PB, SW03PB, and PW01PB were qualified as estimated (UJ) based on a negative response in the associated calibration blank.
- Results for cobalt in PW01PB and SW03PB were qualified as less than the reported values (U) due to contamination in the associated preparation blank.
- Results for nickel in all samples were qualified as less than the reported values (U) due to contamination in the associated preparation blank.
- Results for arsenic in all samples were qualified as estimated (UJ) based on a negative response in the associated preparation blank.
- Results for cadmium in SW01DPPB, SW02PB, and SW03PB were qualified as estimated (UJ) based on a negative response in the associated preparation blank.
- Results for cadmium and selenium in SW01PB were qualified as less than the CRDLs (5.0 U) due to lack of confirmation in the laboratory and field duplicate analyses. The reported value for selenium in this sample warranted qualification as estimated based on an unacceptably high recovery in an associated CRDL standard and the reported value for cadmium warranted qualification as estimated based on a negative response in the associated preparation blank; these qualifiers were superseded by elevation of the reporting limit to the CRDL.
- Based on professional judgment, results for copper and vanadium in SW01DPPB were qualified as less than the CRDLs (25.0 U, and 50.0 U, respectively) due to lack of confirmation at low concentrations in the field duplicate analyses.
- Results for lead in SW01PB and SW01DPPB were rejected (R) as unreliable based on lack of confirmation at a significant concentration in the field duplicate analyses.
- The result for copper in PW01PB was qualified as estimated (J) based on an elevated %RSD among the triplicate measurements of this analyte in this sample.

All "B" flags applied by the laboratory were removed by the validator.

Documentation issues observed in the data package are discussed in Section XII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the inorganics data.



ATTACHMENT A

DATA TABLE SDG No. RX1067 Dissolved Metals in Water

Marion Bragg Landfill - April 2003 - Dissolved Metals in Surface Water Samples

All Results are in ug/l	A11	Res	ults	are	in	110/	7
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All Results ar	re in ug/L					
Collection Poir		PW-1	SW-1	SW-1D	SW-5	SW-6
Sample ID ===	 >	PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No	o. >	RX1067-5	RX1067-1	RX1067-2	RX1067-3	RX1067-4
Collection Date	e. === >	4/29/03	4/29/03	4/29/03	4/29/03	4/29/03
	CRDL					
Aluminum	200	21.0 U	21.0 U	21.0 U	21.0 U	21.0 U
Antimony	60	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U
Arsenic	10	4.4 UJ	4.4 UJ	4.4 UJ	4.4 UJ	4.4 UJ
Barium	200	146	73.3	73.1	73.4	61.5
Beryllium	5	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Cadmium	5	1.2	5.0 U	0.40 UJ	0.40 UJ	0.40 UJ
Calcium	5000	45200	74200	74400	75100	90100
Chromium	10	0. 7 0 UJ	0.70 U	0.70 U	0.70 UJ	0.70 UJ
Cobait	50	1.4 U	0.90 U	0.90 U	0.90 U	1.1 U
Copper	25	9.8 J	2.3 U	25.0 U	2.3 U	2.3 U
Iron	100	19.2 U	19.2 U	19.2 U	19.2 U	19.2 U
Lead	3	2.7 U	R	R	2.7 U	2.7 U
Magnesium	5000	26800	31500	31700	32100	33500
Manganese	15	7.6	20.2	19.9	18.2	39.3
Mercury	0.2	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	40	5.5 U	3.9 U	1.9 U	2.9 U	2.4 U
Potassium	5000	6960	2470	2450	2350	2910
Selenium	5	2.6 U	5.0 U	2.6 U	2.6 U	2.6 U
Silver	10	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
Sodium	5000	16200	20100	20000	19700	28200
Thallium	10	7.0 UJ	7.0 UJ	7.0 UJ	7.0 UJ	7.0 UJ
Vanadium	50	1.0 U	1.0 U	50.0 U	1.0 U	1.0 U
Zinc	20	38.1	8.5 U	8.5 U	8.5 U	8.5 U



ATTACHMENT B

INORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG No. RX1067
Dissolved Metals in Water

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		PW-1 PW01PB
Lab Name: COMPUCHEM	Contract:	
Lab Code: LIBRTY Case No.:	SAS No.:	SDG No.: RX1067
Matrix (soil/water): WATER	Lab Sample ID:	RX1067-5
Level (low/med): LOW	Date Received:	5/1/03
% Solids: 0.0		

CAS No.	Analyte	Concentration	C	Q	М
7429-90-5	Aluminum	21.0	Ū		P
7440-36-0	Antimony	4.5	Ü	1 9	P
7440-38-2	Arsenic	4.4	V	IUJ.	P
7440-39-3	Barium	146	F	Ţ Ţ	P
7440-41-7	Beryllium	0.10	U	1	P
7440-43-9	Cadmium	1.2	B		P
7440-70-2	Calcium	45200	T	1	P
7440-47-3	Chromium	0.70	W	IUJ ?	P
7440-48-4	Cobalt	1.4	B	IU 3	₽ ₽
7440-50-8	Copper	9.8	F	JU	P
7439-89-6	Iron	19.2	ש		P
7439-92-1	Lead	2.7	lα		P
7439~95-4	Magnesium	26800	<u>l</u> .		P
7439-96-5	Manganese	7.6	R		P
7439-97-6	Mercury	0.10	שׁ		CV
7440-02-0	Nickel	5.5	15	IU	P
7440-09-7	Potassium	6960		<u> </u>	P
7782-49-2	Selenium	2.6	ט	1	P
7440-22-4	Silver	0.80	מן	1 3	P
7440-23-5	Sodium	16200		1 74	P
7440-28-0	Thallium	7.0	JY	UJS	P
7440-62-2	Vanadium	1.0	U	-	P
7440-66-6	Zinc	38.1	}	1	P

Color Befor	e: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After	: COLORLESS	Clarity After:	CLEAR	Artifacts:	
Comments:	DISSOLVED				
					0

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		SW-1 SW01PB
Lab Name: COMPUCHEM	Contract:	
Lab Code: LIBRTY Case No.:	SAS No.:	SDG No.: RX1067
Matrix (soil/water): WATER	Lab Sample ID:	RX1067-1
Level (low/med): LOW	Date Received:	5/1/03
% Solids: 0.0		•

	1		Ta		
CAS No.	Analyte	Concentration	C	Ω	M
7429-90-5	Aluminum	21.0	U	1	P
7440-36-0	Antimony	4.5	שׁן	1 8	P
7440-38-2	Arsenic	4.4	V	IUJ PI	P
7440-39-3	Barium	73.3	17		P
7440-41-7	Beryllium	0.10	טן		₽
7440-43-9	Cadmium	5.0 0.52	 B	lu T	P
7440-70-2	Calcium	74200	1	1 1	P
7440-47-3	Chromium	0.70	שן	1	P
7440-48-4	Cobalt	0.90	מ	<u> </u>	P
7440-50-8	Copper	2.3	מן	3/2	P
7439-89-6	Iron	19.2	Ü	17	P
7439-92-1	Lead	1 R 2.7	+4	1 1	P
7439-95-4	Magnesium	31500			P
7439-96-5	Manganese	20.2		\prod	P
7439-97-6	Mercury	0.10	U	1	CV
7440-02-0	Nickel	3.9	/B	14 1	P
7440-09-7	Potassium	2470	F	\	P
7782-49-2	Selenium	5.0 4.2	12	lu gi	P
7440-22-4	Silver	0.80	U	4	P
7440-23-5	Sodium	20100			P
7440-28-0	Thallium	7.0	No.	IUJ W	P
7440-62-2	Vanadium	1.0	U	1 01	P
7440-66-6	Zinc	8.5	טן		P

Color Before	: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After:	COLORLESS	Clarity After:	CLEAR	Artifacts:	
Comments:	DISSOLVED				
					44

U.S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-ID	SW01DPPB

Lab Name: COMPUCHEM		Contract:	ISW-ID	•
Lab Code: LIBRTY	Case No.:	SAS No.:	SDG No.: RX1067	-
Matrix (soil/water):	WATER	Lab Sample ID:	RX1067-2	
Level (low/med): L	OW	Date Received:	5/1/03	

% Solids: 0.0

CAS No.	Analyte	Concentration	C	Q	М
7429-90-5	Aluminum	21.0	U		P
7440-36-0	Antimony	4.5	טן	1 8	P
7440-38-2	Arsenic	4.4	W	IUJ I	P
7440-39-3	Barium	73.1	F	1 1	P
7440-41-7	Beryllium	0.10	la l		P
7440-43-9	Cadmium	0.40	W	UJ 1	P
7440-70-2	Calcium	74400	Ī		P
7440-47-3	Chromium	0.70	ש	1 1	P
7440-48-4	Cobalt	0.90	ט	3	P
7440-50-8	Copper	1 25.0 2.6	13	IU \$	P
7439-89-6	Iron	19.2	ט	12	P
7439-92-1	Lead	1 R -3.7	+	1 1	P
7439-95-4	Magnesium	31700			P
7439-96-5	Manganese	19.9		1 1	P
7439-97-6	Mercury	0.10	ט		CV
7440-02-0	Nickel	1.9	P	14 1	P
7440-09-7	Potassium	2450	B	11	P
7782-49-2	Selenium	2.6	U	I KI	P
7440-22-4	Silver	0.80	U	N N	P
7440-23~5	Sodium	20000		। ऱ्	P
7440-28-0	Thallium	7.0	V	1 WI	P
7440-62-2	Vanadium	50.0 1.3	 B	UZ	P
7440-66-6	Zinc	8.5	טן		P

Color Before	: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After:	COLORLESS	Clarity After:	CLEAR	Artifacts: _	
Comments:	DISSOLVED			·····	
					10

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-5 SWO2PB	

Lab Name: COMPUCHEM	Contract:	<u>5W-5</u>
Lab Code: LIBRTY Case No.:	SAS No.:	SDG No.: RX1067
Matrix (soil/water): WATER	Lab Sample ID:	RX1067-3
Level (low/med): LOW	Date Received:	5/1/03
& Colider O O		

% Solids: 0.0

CAS No.	Analyte	Concentration	C	Q M
7429-90-5	Aluminum	21.0	U	P
7440-36-0	Antimony	4.5	ש	WP
7440-38-2	Arsenic	4.4	N/	IUJ 81 P
7440-39-3	Barium	73.4	17	P
7440-41-7	Beryllium	0.10	טן	P
7440-43-9	Cadmium	0.40	Ø	UJ IP
7440-70-2	Calcium	75100		P
7440-47-3	Chronium	0.70	17	UJ I P
7440-48-4	Cobalt	0.90	U	(P
7440-50-8	Copper	2.3	U	N P
7439-89-6	Iron	19.2	טן	P P
7439-92-1	Lead	2.7	טן	P PP
7439-95-4	Magnesium	32100	Ī.	P
7439-96-5	Manganese	18.2	1	P.
7439-97-6	Mercury	0.10	U	\ CV
7440-02-0	Nickel	2.9	B	U 'I P
7440-09-7	Potassium	2350	13	P
7782-49-2	Selenium	2.6	ט	P
7440-22-4	Silver	0.80	U	N P
7440-23-5	Sodium	19700		7 P
7440-28-0	Thallium	7.0	V	A CC TM
7440-62-2	Vanadium	1.0	U	P
7440-66-6	Zinc	8.5	U	P

Color Befor	e: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After	: COLORLESS	Clarity After:	CLEAR	Artifacts: _	
Comments:	DISSOLVED	•			
					12

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1.16 1	SWO3PB		
12W-6		 	

		1211-6
Lab Name: COMPUCHEM	_ Contract:	
Lab Code: LIBRTY Case No.:	SAS No.:	SDG No.: RX1067
Matrix (soil/water): WATER	Lab Sample ID:	RX1067-4
'Level (low/med): LOW	Date Received:	5/1/03
& Solida: 0.0		

CAS No.	Analyte	Concentration	C	Ω	М
7429-90-5	Aluminum	21.0	ט		P
7440-36-0	Antimony	4.5	טן	1 8	P
7440-38-2	Arsenic	4.4	W	IUJ	P
7440-39-3	Barium	61.5	19	T \ \ \	P
7440-41-7	Beryllium	0.10	ט		P
7440-43-9	Cadmium	0.40	كرا	IUJ	P
7440-70-2	Calcium	90100	1		P
7440-47-3	Chronium	0.70	V	UJ 1	P
7440-48-4	Cobalt	1.1	P	14 0	P
7440-50-8	Copper	2.3	טן	- 0	P
7439-89-6	Iron	19.2	ט	1 7	P
7439-92-1	Lead	2.7	שן		P
7439-95-4	Magnesium	33500			P
7439-96-5	Manganese	39.3			P
7439-97-6	Mercury	0.10	טן		ÇV
7440-02-0	Nickel	2.4	17	lu 'I	P
7440-09-7	Potassium	2910	B	1	P
7782-49-2	Selenium	2.6	Ū	1 6	P
7440-22-4	Silver	0.80	ט	1 2	P
7440-23-5	Sodium	28200		2	P
7440-28-0	Thallium	7.0	1	E WI	P
7440-62-2	Vanadium	1.0	U	3	P
7440-66-6	Zinc	8.5	U	1	P

Color Before	: COLORLESS	Clarity Before:	CLEAR	Texture:	
Color After:	COLORLESS	Clarity After:	CLEAR	Artifacts:	
Comments:	DISSOLVED				
					13



DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA Chemical Oxygen Demand (COD) in Water

CET Report Dated May 13, 2003 April 2003 Sample Collections

Chemical Analyses Performed by:

Chemical & Environmental Technology, Inc. Research Triangle Park, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

July 2, 2003

92241/CAE/DAS \MARION\Aprt03\cod



EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (chemical oxygen demand [COD]) prepared by Chemical & Environmental Technology, Inc. (CET), under subcontract to CompuChem Environmental, for 14 water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package that had no identification number but was dated May 13, 2003. This data package was received for review on May 16, 2003, with additional documentation provided on July 1, 2003. The following field samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)	PW01PB (PW-1)	SW01PB (SW-1)
SW01DPPB (SW-1D)	SW02PB (SW-5)	SW03PB (SW-6)

Based on the validation effort, reported sample results were qualified or corrected as follows:

- Results for COD in GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U).
- All sample results for COD (including reporting limits) were recalculated by the validator and reported to reflect three significant figures (rather than two, as reported by the laboratory).

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section IX). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section VIII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the COD data.



INTRODUCTION

Analyses were performed according to EPA's "Chemical Analysis of Water and Wastes" (EPA-600/4-79-020), March 1983, Method 410.4. Since no guidelines specific to the analytical method used are available, the validation was based on the requirements of the referenced procedure, the specifications of the project-specific Quality Assurance Project Plan (QAPP), and best professional judgment. The validation approach was similar to that described in EPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994). Results of sample analyses were reported by the laboratory without qualifications.

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that the data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's National Functional Guidelines:

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- R The data are unusable. (Note: The analyte may or may not be present.)
- J The associated value is an estimated quantity.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the client-customized data tables (Attachment A) and the laboratory's Analytical Reports (Attachment B) to qualify the results as appropriate according to the review of the data package.

Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last



resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The water samples were collected on 4/29-30/03. All COD analyses were conducted well within the 28-day holding time specified by both the referenced method and the QAPP.

An acceptable (4°C ±2°C) cooler temperature on receipt of the samples at CET (3°C) was recorded on the chain of custody (COC) records documenting the shipment of samples from CompuChem to CET. Preservation with sulfuric acid and ice was also recorded on the two applicable COCs by CompuChem, but no documentation of sample pH on receipt at CET was found in the data package. However, the use of sulfuric acid and ice was documented on the field COCs (documenting shipment of the samples from the site to CompuChem) and verification of successful acidification of the COD sample containers was documented on CompuChem's receiving logs, all of which were provided in CompuChem's data packages for the other analysis parameters requested on these samples. Therefore, no action was taken on this basis.

II. Calibrations

The reported COD analyses were performed on 5/6/03 and 5/7/03. Raw data documentation of an initial calibration (IC) performed on 6/3/02 was provided on 7/1/03 at the validator's request. This date was recorded on the bench sheets in a field labeled "Curve Date," but the supporting data for the IC were not provided in the data package as initially received for review.

The 6/3/02 IC was established using five standard concentrations ranging from 10 mg/L to 150 mg/L. The best-fit linear regression describing the calibration curve gave an acceptable correlation coefficient (>0.995) and was verified by the validator.

Although the referenced method does not specify a maximum period of time that an IC may be used, good laboratory practice would suggest that 11 months is excessive. Ideally, the instrument should be calibrated prior to each use. Realistically, a minimum of once every month or two is strongly recommended.

A check standard at 75 mg/L was run at the start of each COD analysis series. Acceptable recoveries (QC 85-115%) were reported (98% and 98%) and verified by the validator.

III. Blanks

A blank was run at the start of each COD analysis series. No absorbance response was documented for either of these blanks.



The laboratory-specified RL of 10 mg/L is equivalent to the low concentration standard used to establish the initial calibration, and is therefore supported by the data as presented.

All sample results were greater than or equal to 10 mg/L and were reported to two significant figures by the laboratory; this is consistent with the results as found on the bench sheets. However, the historical data generated in support of this project reflect three significant figures for results that are greater than or equal to 10.0 mg/L. Since raw data for the relevant IC were provided by the laboratory, the sample results could be calculated by the validator and reported to three significant figures, where appropriate, for consistency with the historical project data. Positive results reported for COD in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, GW09FBPB, PW01PB, and SW03PB and the RLs for all remaining samples in this data set were so corrected by the validator. In several cases, it was noted that the validator-calculated result did not round to the laboratory-reported value. This was assumed to be due to rounding error, and no action was taken on this basis.

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was affected by the findings of the validation effort.

VIII. Documentation

Field-initiated COC records were not included in the COD data package, but were available in the CompuChem data packages for the other analysis parameters run on these samples. Two COC records documenting transfer of the samples from CompuChem to CET were present. All samples reported in this data set were listed on these forms, which were accurately completed except that sample pHs were not recorded by CET on sample receipt.

At the validator's request for missing IC raw data, CET provided (through CompuChem) the appropriate raw data for the relevant IC. The IC raw data page was inserted into the original data package by the validator.

These documentation issues do not directly affect the technical validity of the analytical data generated, but they could be problematic if the data were used in litigation.

IX. Overall Assessment

Based on the validation effort, reported sample results were qualified or corrected as follows:

Results for COD in all ground water samples where it was detected (GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB) were qualified as less than the reported values (U) due to contamination in the associated field blank.



• All sample results for COD (including RLs) were recalculated by the validator and reported to reflect three significant figures (rather than two, as reported by the laboratory) for consistency with the historical data generated for this project.

Documentation issues are discussed in Section VIII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the COD data.



ATTACHMENT A

DATA TABLES
COD in Water
April 2003 Sample Collections - Marion Bragg Landfill
CET Report dated May 13, 2003

Page 1 of 2

Marion Bragg Landfill - April 2003 - Chemical Oxygen Demand in Ground Water and Surface Water

Results are in mg/L								
Collection Point ===>	MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID =====>	GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No. ===>	206942	206943	206941	206937	206938	206939	206940	206944
Collection Date. ===>	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03
RL								
COD 10.0	10.0 U	10.0 U	26.4 U	15.6 U	U 7.71	15.6 U	63.0 U	10.0 U

Marion Bragg Landfill - April 2003 - Chemical Oxygen Demand in Ground Water and Surface Water

Results are in mg/L

Collection Poir Sample ID ———————————————————————————————————	o, ===>	MB-10 GW01PB 206936 4/30/03	Field Blank GW09FBPB 206935 4/30/03	PW-1 PW01PB 206934 4/29/03	SW-1 SW01PB 206930 4/29/03	SW-1D SW01DPPB 206931 4/29/03	SW-5 SW02PB 206932 4/29/03	SW-6 SW03PB 206933 4/29/03
	RL	=			······································			
COD	10.0	10.0 U	15.6	17.7	10.0 U	10.0 U	10.0 U	19.9



ATTACHMENT B

ANALYTICAL REPORTS
COD in Water
April 2003 Sample Collections - Marion Bragg Landfill
CET Report dated May 13, 2003

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206942 SAMPLE ID- GW08PB

MB-1

SAMPLE MATRIX- GW

DATE SAMPLED- 04/30/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME SAMPLED- 1400

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

RECEIVED BY- MINH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/07/03 JMB

_<10_mg/L

PQL = Practical Quantitation Limit

10.0 U mg/L Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206943 SAMPLE ID- GWO8DPPB MB-1D

SAMPLE MATRIX- GW

DATE SAMPLED- 04/30/03

TIME RECEIVED- 1150

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

DELIVERED BY- C BRAND

TIME SAMPLED- 1400 RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD DATE

BY RESULT UNITS

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/07/03 JMB

<10 mg/1 10.0 U mg/L 10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

COE 2/2/02

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM

Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206941 SAMPLE ID- GW07PB

MB-2

SAMPLE MATRIX- GW

DATE SAMPLED- 04/30/03

TIME SAMPLED- 1320

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/07/03 JMB

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206937 SAMPLE ID- GWO3PB MB-

DATE SAMPLED- 04/30/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

SAMPLE MATRIX- GW TIME SAMPLED- 0945

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/06/03 JMB

15.6 U CaE7/2/03

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206938 SAMPLE ID- GW04PB

DATE SAMPLED- 04/30/03

MB-6

SAMPLE MATRIX- GW TIME SAMPLED- 1015

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

RECEIVED BY- MNH

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/07/03 JMB

17 mg/L

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM

Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206939 SAMPLE ID- GW05PB MB-7

DATE SAMPLED- 04/30/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

SAMPLE MATRIX- GW TIME SAMPLED- 1100 RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS

POL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/07/03 JMB

-15 mg/L

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM

Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206940 SAMPLE ID- GW06PB

MB-8

SAMPLE MATRIX- GW

DATE SAMPLED- 04/30/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME SAMPLED- 1145

TIME RECEIVED- 1150 DELIVERED BY- C BRAND

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/07/03 JMB

-63 mg/L

10

43.0 U

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206944 SAMPLE ID- GW02PB

SAMPLE MATRIX- GW TIME SAMPLED- 0900

DATE SAMPLED- 04/30/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/07/03 JMB

<10 mg/L 10.0 U

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM

Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206936 SAMPLE ID- GW01PB

MB-10

SAMPLE MATRIX- GW

DATE SAMPLED- 04/30/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME SAMPLED- 0820

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/06/03 JMB

-<10 mg/L 10.0 U

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM

Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206935 SAMPLE ID- GW09FBPB

DATE SAMPLED- 04/30/03

Field Blank

SAMPLE MATRIX- GW TIME SAMPLED- 1130

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT TIME RECEIVED- 1150

DELIVERED BY- C BRAND

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS

15.6

POL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/06/03 JMB

15 mg/L

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

CaE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206934 SAMPLE ID- PW01PB

PW-1

SAMPLE MATRIX- GW

DATE SAMPLED- 04/29/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME SAMPLED- 1620

TIME RECEIVED~ 1150

DELIVERED BY- C BRAND

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD DATE

BY

RESULT UNITS

POL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/06/03 JMB

-1-7 mg/L

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206930 SAMPLE ID- SW01PB

5W-1

SAMPLE MATRIX- GW

DATE SAMPLED- 04/29/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME SAMPLED- 1510

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD DATE BY RESULT UNITS POL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/06/03 JMB

~10 mg/L

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

Cat 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM

Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206931 SAMPLE ID- SW01DPPB

5W-1D

SAMPLE MATRIX- GW

DATE SAMPLED- 04/29/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME SAMPLED- 1510

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD DATE BY

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/06/03 JMB

-<10 mg/L 10.0 U

RESULT UNITS

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206932 SAMPLE ID- SW02PB

3W-5

SAMPLE MATRIX- GW

DATE SAMPLED- 04/29/03

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

TIME SAMPLED- 1645

TIME RECEIVED- 1150

DELIVERED BY- C BRAND

RECEIVED BY- MNH

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 05/06/03 JMB

<10 mg/L

10

PQL = Practical Quantitation Limit

10.0 U

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206933 SAMPLE ID- SW03PB 5W-6

DATE SAMPLED- 04/29/03

TIME RECEIVED- 1150

DATE RECEIVED- 05/02/03 SAMPLER- CLIENT

DELIVERED BY- C BRAND

SAMPLE MATRIX- GW TIME SAMPLED- 1700 RECEIVED BY- MNH

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PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS METHOD DATE BY RESULT UNITS PQL

CHEMICAL OXYGEN DEMAND EPA 410.4 05/06/03 JMB

-19 mg/L

19.9

10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

Ca & 7/3/02

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724